Vol. 992 Number 1

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

March 4, 1980

U.S.
DEPARTMENT
OF COMMERCE

Patent
and
Trademark
Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

March 4, 1980 Volume 992 Number 1

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT consult the notice entitled "update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of February 12, 1980.

Note that since August 1, 1979 certain fees for the processing of International Applications have been increased. The current schedule of fees is as follows:

Transmittal fee	$35.00
Search fee	300.00
Basic fee (first 30 pages)	190.00
Basic fee supplement (each sheet over 30)	3.50
Designation fee	45.00

SIDNEY A. DIAMOND,
Commissioner of Patents and Trademarks.

Jan. 28, 1980.

Reduction of European Search Fee for PCT Cases

The following letter dated December 21, 1979 from Dr. J. B. van Benthem, the President of the European Patent Office, was received by the Commissioner of Patents and Trademarks and is being published to provide the information to applicants using the Patent Cooperation Treaty (PCT). The effect of the decision of the Administration Council of the European Patent Organization is to reduce the search fee required by the European Patent Office by 20% if the application was filed under the PCT and was searched by the United States Patent and Trademark Office acting as an International Searching Authority.

The letter and accompanying annex are reproduced below.

SIDNEY A. DIAMOND,
Commissioner of Patents and Trademarks.

"Dear Mr. Diamond:

Pursuant to Article 157, paragraph 3, EPC, the Administrative Council of the European Patent Organization is entitled to decide under what conditions and to what extent:

a) the supplementary European search report under Article 157, paragraph 2a, EPC is to be dispensed with

b) the search fee as provided for in Article 157, paragraph 2b, EPC is to be reduced.

Up to the present, the Administrative Council of the EPO has taken decisions in regard to Article 157, paragraph 3, in respect of international applications for which the international search report has been drawn up by the following Offices: the European Patent Office, the Swedish Patent Office, the Austrian Patent Office, the United States Patent and Trademark Office, the Japanese Patent Office and the USSR State Committee for Inventions and Discoveries.

The decisions concerning the Swedish and Austrian Patent Offices are based on the agreements concluded between these Offices and the EPO pursuant to Section III, paragraph 2 and Section IV, paragraph 2 of the Protocol on the Centralisation of the European Patent System, which is an integral part of the EPC. These agreements prescribe that the searches to be carried out by these Offices are to meet the same criteria and be of the same standard as applied at the EPO.

For these reasons the Administrative Council has decided that in respect of Sweden and Austria the supplementary European search report under Article 157, paragraph 2a, EPC is to be dispensed with and a search fee as provided for in Article 157, paragraph 2b, EPC shall not be charged.

As far as those States are concerned which are not members of the European Patent Organization, the Administrative Council of the EPO decided on 14 September 1979, that the search fee provided for in Article 157, paragraph 2b, EPC, shall be reduced by one-fifth in the case of international applications on which an international search report has been drawn up by the United States Patent and Trademark Office, the Japanese Patent Office or the USSR State Committee for Inventions and Discoveries. This reduction reflects the economy expected to be made in drawing up the supplementary European search report according to EPO standards.

Annexed you will find a copy of the Decision of 14 September 1979. It applies to all international applications filed since 1 June 1979.

Yours sincerely,

J. B. Van Benthem.
(President)."

ANNEX

The Administrative Council of the European Patent Organization

Having regard to the European Patent Convention (hereinafter called "the Convention"), and in particular Article 157, paragraph 3, thereof,

Has decided as follows:

ARTICLE 1

The search fee provided for in Article 157, paragraph 2(b), of the Convention shall be reduced by one fifth in the case of international applications on which an international search report has been drawn up by the United States Patent and Trademark Office, the Japanese Patent Office or the USSR State Committee for Inventions and Discoveries.

ARTICLE 2

This decision shall enter into force on 14 September 1979. It shall apply to all international applications filed since 1 June 1978.

Done at Berlin, 14 September 1979.

For the Administrative Council
The Chairman,
G. VIANES.

END OF ANNEX

Patent Suits

Notices under 35 USC 290; Patent Act of 1952

2,800,631, Vereinigte Oesterreichische Eisen- und Stahlwerke Aktiengesellschaft, METHOD OF CARRYING OUT MELTING PROCESSES, **filed** Sept. 6, 1968, D.C., W.D. Pa. (Pittsburgh), Doc. 71–819, *Kaiser Industries Corp. et al.* v. *National Steel Corp.* Stipulation of dismissal with prejudice and without costs to either parties filed Nov. 21, 1979. **Same, filed** Oct. 15, 1971, D.C., W.D. Pa. (Pittsburgh), Doc. 71–816, *Kaiser Industries Corp. and Brassert Oxygen Technik AG* v. *Granite City Steel Company et al.* Stipulation of dismissal with prejudice and without costs to either parties filed Nov. 21, 1979. **Same, filed** Mar. 5, 1974, D.C., W.D. Pa. (Pittsburgh), Doc. 74–217, *Kaiser Industries Corp. et al.* v. *Jones & Laughlin Steel Corporation.* Stipulation of dismissal with prejudice and without costs to either parties filed Dec. 13, 1979. **Same, filed** Sept. 18, 1961, D.C., W.D. Pa. (Pittsburgh), Doc. 61–551, *Kaiser Industries Corp.* v. *Jones & Laughlin Steel.* Stipulation of dismissal with prejudice and without costs to either parties filed Dec. 14, 1979. **Same, filed** Apr. 13, 1962, D.C., W.D. Pa. (Pittsburgh), Doc. 62–272, *Kaiser Industries Corp. et al.* v. *Jones & Laughlin Steel Corp.* Stipulation of dismissal with prejudice and without costs to either parties filed Dec. 14, 1979.

2,887,220, Chester P. Hankus, PACKAGING DEVICE; **2,889,650,** same, ARTIFICIAL TREE; **2,996,181,** same, PACKAGING DEVICE FOR ARTIFICIAL CHRISTMAS TREE; **3,067,797,** same, FOIL SLITTING MECHANISM; **3,069,192,** same, SEPARABLE JOINT FOR POLES; **3,477,897,** same, ARTIFICIAL TREE, **filed** Dec. 12, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c5040, *Chester P. Hankus* v. *Revlis, Inc.*

2,889,650. (See 2,887,220.)

2,996,181. (See 2,887,220.)

3,009,149, Ramsey McDonald, AUTOMATIC DIAL RADIO TELEPHONE SYSTEM, **filed** Dec. 13, 1979, D.C., S.D.N.Y., Dec. 79–C–6765 MJL, *Ramsey McDonald* v. *Motorola Communications and Electronics, Inc.*

3,055,904, Geigy Chemical Corp., NEW ISOINDOLINE DERIVATIVES, **filed** May 31, 1979, D.C., S.D.N.Y., Doc. 79–C–2824 RO, *Premo Pharmaceutical Laboratories, Inc.* v. *USV Laboratories, Inc.* Judgment and order dismissing claims and counterclaims with prejudice filed Nov. 9, 1979.

3,055,988, Shure Brothers, Inc., MAGNETIC PHONOGRAPH PICKUP; **3,077,521,** same, STEREOPHONIC MOVING MAGNET PHONOGRAPH PICKUP; **3,077,522,** same, STEREO-

PHONIC PICKUP CARTRIDGE, **filed** May 11, 1976, D.C., N.D. Calif. (San Francisco), Doc. C–76–964 SW, *Shure Brothers, Incorporated* v. *Tower Records, Inc.* Case reopened on Jan. 3, 1980.

3,067,797. (See 2,887,220.)

3,069,192. (See 2,887,220.)

3,077,521. (See 3,055,988.)

3,077,522. (See 3,055,988.)

3,081,230, Smith, Kline & French Laboratories, DIURETIC AND ANTIHYPERTENSIVE TRIAMINOARYLPTERIDINES, **filed** Nov. 29, 1979, D.C.N.J. (Newark), Doc. C–79–3434, *SK & F. Co.* v. *Premo Pharmaceutical Laboratories, Inc.* **Same, filed** Dec. 19, 1979, D.C.N.J. (Newark), Doc. 79–3611, *SK & F., Co.* v. *Pharmadyne Laboratories, Inc.*

3,081,370, Jerome H. Lemelson, AUTOMATIC MEASUREMENT APPARATUS, **filed** Sept. 21, 1979, U.S. Court of Claims (Washington, D.C.), Doc. 427–79C, *Jerome H. Lemelson* v. *The United States.*

3,087,663, James K. Anderson, APPARATUS FOR ADJUSTING PRINTING WEB TENSION, **filed** Dec. 28, 1979, D.C., S.D. Ohio (Dayton), Doc. C–3–79–445, *James K. Anderson* v. *Harris Corporation.*

3,136,676, Voplex Corporation, METALLIZED PLASTIC EXTRUSION PRODUCTS AND METHOD OF MAKING SAME, **filed** Sept. 26, 1979, D.C. Del. (Wilmington), Doc. 79–458, *Voplex Corporation* v. *Pantasote, Inc.* Stipulation and order dismissing case without prejudice filed Oct. 22, 1979.

3,169,142, Stephan Chemical Company, METHOD FOR SULFONATION AND SULFATION OF ORGANIC COMPOUNDS, **filed** Dec. 21, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c4732, *Stephan Chemical Company* v. *Onyx Chemical Company.* Substitution of dismissal with prejudice pursuant to settlement agreement for the order of Aug. 10, 1979, entered Nov. 2, 1979.

3,173,694, Hamilton Kent Manufacturing Co., Inc., GASKET, **filed** Nov. 13, 1979, D.C., N.D. Ohio (Cleveland), Doc. C79–2130, *Hamilton Kent Manufacturing Co., Inc.* v. *Indian Head, Inc. and Carlon.*

3,204,495, James Matthews, INSULATION REMOVING TOOL; **3,372,189,** same, INSULATION JACKET SHAVING TOOL, **filed** May 9, 1978, D.C., N.D. Ill. (Chicago), Doc. 78c1809, *Ripley Co.* v. *Ideal Industries.* Dismissal without prejudice and without costs filed Oct. 3, 1979.

3,216,674, William B. McLean, PROPORTIONAL NAVIGATION SYSTEM FOR A SPINNING BODY IN FREE SPACE; **3,758,051,** Donald D. Williams, VELOCITY CONTROL AND ORIENTATION OF A SPIN-STABILIZED BODY; **Re. 26,887,** William B. McLean, PROPORTIONAL NAVIGATION SYSTEM FOR A SPINNING BODY IN FREE SPACE, **filed** June 18, 1979, D.C., S.D.N.Y., Doc. 79–C–3169 LBS, *Messerschmitt-Boelkow-Blohm GmbH* v. *Hughes Aircraft Co.* Defendants motion to dismiss is granted. Nov. 20, 1979.

3,231,785, Anthony D. Calabro, CIRCUIT BOARD MOUNTING DEVICE, **filed** Feb. 18, 1976, D.C.N.J. (Trenton), Doc. C–76–297, *Anthony D. Calabro* v. *Taurus Corporation.* Action dismissed without costs and without prejudice on Dec. 19, 1979.

3,295,507, Aaron D. Carter, LUBRICATION SYSTEM FOR INTERNAL COMBUSTION ENGINES, **filed** June 14, 1979, D.C., W.D. Okla. (Oklahoma City). Doc. C–79–0685–T. *Aaron D. Carter* v. *Caterpillar Tractor Co.* Cause and counterclaim dismissed with prejudice on Oct. 5, 1979.

3,327,664, Detexomat Machinery Limited, AUTOMATIC TOE-CLOSING OF STOCKINGS; **3,429,284,** same; **3,908,874,** same, HOSIERY MANUFACTURE, **filed** Nov. 26, 1979, D.C., W.D.N.C. (Charlotte), Doc. C–C–79–0355, *Detexomat Machinery Limited* v. *Speizman Industries, Inc.*

3,332,327, Elastic Stop Nut Corporation of America, PAVEMENT MARKER, **filed** Sept. 19, 1979, D.C., N.D. Tex. (Dallas), Doc. CA3–79–1184–D, *Amerace Corporation* v. *Ferro Corporation.*

3,336,694, IMS Corporation, AIR CURTAIN TYPE INSECT TRAP; **3,753,010,** same, FLUORESCENT LAMP STROBING CIRCUIT; **3,755,666,** same, END CAP CONSTRUCTION, **filed** Dec. 5, 1979, D.C., N.D. Tex. (Dallas), Doc. CA–3–79–1491–C, *Texas Western Financial Corp. and Holly Springs Inc.* v. *Texaco, Inc.*

3,339,419, Doyle E. Wilcox, ACCELEROMETER, **filed** Dec. 21, 1979, D.C., N.D. Ill. (Rockford), Doc. 79c20105, *Rockwell International Corp.* v. *Sundstrand Data Control Inc. and Sundstrand Corporation.*

3,345,458, Radio Corporation of America, DIGITAL STORAGE AND GENERATION OF VIDEO SIGNALS, **filed** May 23, 1978, D.C. Del. (Wilmington), Doc. 78–198, *RCA Corporation* v. *Applied Digital Data Systems, Inc.* **Same, filed** May 17, 1979, D.C. Del. (Wilmington), Doc. 78–198, *RCA Corporation* v. *Hazeltine Corporation.* **Same, filed** May 25, 1979, D.C. Del. (Wilmington), Doc. 79–491, *Lear Siegler, Inc.* v. *RCA Corp.*

3,362,357, J. A. Vance Company, ARCUATED TABLE SLIDE FOR EXPANDABLE TABLES, **filed** Apr. 4, 1979, D.C., W.D.N.C. (Statesville), Doc. ST–C–79–11, *Sun Metal Products, Inc.* v. *Acme Metal Slide, Inc.* Plaintiff's action against defendant is dismissed on Nov. 19, 1979.

3,377,908, E. H. Stau, BLIND RIVET ASSEMBLY WITH LOCKING MEANS, **filed** Nov. 8, 1979, D.C., C.D. Calif. (Los Angeles), Doc. 79–04341, *Olympic Fastening Systems, Inc.* v. *Monogram Industries, Inc.*

3,383,487, Robert Wiener, THIN FLEXIBLE MAGNETIC SWITCH; **4,066,851,** White and Seeger, KEYBOARD SWITCH ASSEMBLY HAVING FOLDABLE PRINTED CIRCUIT BOARD, INTEGRAL SPACER AND PREFORMED DEPRESSION-TYPE ALIGNMENT FOLD, **filed** Oct. 30, 1979, D.C., C.D. Calif. (Los Angeles), Doc. 79–4174–DWW, *Chomerics, Inc.* v. *Telaris Telecommunications.*

3,416,984, Sealed Air Corporation, METHOD AND APPARATUS FOR MAKING CELLULAR MATERIAL FROM THERMOPLASTIC SHEETS, **filed** Aug. 27, 1979, U.S. Court of Customs and Patent Appeals (Washington, D.C.), Doc. 79–35, *Sealed Air Corporation* v. *U.S. International Trade Commission et al.* **Same, filed** Sept. 10, 1979, U.S. Court of Customs and Patent Appeals (Washington, D.C.), Doc. 79–38, *Tong Seae Industrial Co., Ltd. et al.* v. *U.S. International Trade Commission and Sealed Air Corp.* **Same, filed** Oct. 26; 1979, U.S. Court of Customs and Patent Appeals (Washington, D.C.), Doc. 80–4, *Unipak (H.K.) Ltd.* v. *U.S. International Trade Commission et al.* **Same, filed** Nov. 13, 1979, D.C., N.D. Calif. (San Francisco), Doc. C79–3283 WAI, *Sealed Air Corp.* v. *USA Polyinternational, Inc. et al.*

3,429,284. (See 3,327,664.)

3,444,007, Hooker Chemical Corporation, PROCESS OF FORMING PAINT-BASE COATINGS ON ZINC AND ZINC ALLOY SURFACES, **filed** Sept. 27, 1979, D.C. Md. (Baltimore), Doc. T–79–1805, *Oxy Metal Industries Corporation* v. *Roper Corporation.*

3,446,199, Arthur Saveca, SPRING ACTUATED BALL PROJECTING DEVICE, **filed** July 14, 1978, D.C., N.D.N.Y. (Utica), Doc. 78–CV–342, *Arthur Saveca* v. *K-Tel International, Inc.* **Same, filed** July 14, 1978, D.C., N.D.N.Y. (Utica), Doc. 78–CV–343, *Arthur Saveca* v. *Barker's Department Stores, Inc.* **Same, filed** July 14, 1978, D.C., N.D.N.Y. (Utica), Doc. 78–CV–344, *Arthur Saveca* v. *Rod Crew.*

3,472,714, Brad Ragan, Inc., METHOD OF REBUILDING PREVIOUSLY USED TIRES, **filed** Dec. 7, 1979, D.C., S.D. Ohio (Dayton), Doc. C–3–79–426, *Brad Ragan, Inc.* v. *Schrader's Incorporated.*

3,477,897. (See 2,887,220.)

3,499,302, Spain, Oliver, Flora and Powell, CYLINDER LOCK, **filed** Dec. 5, 1979, D.C., W.D. Va. (Roanoke), Doc. 79–0313–R, *Medeco Security Locks, Incorporated* v. *KIS.*

3,521,588, Gerald D. Atlas, MOVABLE FLOATING BOAT ANCHORAGE, **filed** Nov. 20, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c4892, *Paragon Poll Enterprises, Inc.* v. *Chicago Park District.*

3,531,017, LeBron, Inc., HOT CANNED FOOD VENDING MACHINE, **filed** Nov. 9, 1978, D.C. Nebr. (Omaha), Doc. CV–78–0–489, *LeBron Internationale', Inc.* v. *CAB Enterprises, Inc. et al.* Defendant's motion to dismiss is granted without prejudice on Oct. 24, 1979.

3,552,469, B & J Manufacturing Co., TIRE BEAD SEATER; **3,675,705,** same, TIRE BEAD SEATING AND INFLATION APPARATUS, **filed** Aug. 29, 1979, D.C., E.D. Mich. (Detroit), Doc. 79–73373, *B & J Manufacturing Co.* v. *Brown-Hutchinson, Inc. et al.* Defendants are permanently enjoined from infringing plaintiffs patents. Oct. 19, 1979.

3,559,383, COE Laboratories, Inc., BENCH STRUCTURE WITH BUILT-IN DUST COLLECTOR, **filed** Nov. 13, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c4743, *COE Laboratories, Inc.* v. *St. Charles Manufacturing Corporation.*

3,572,189. (See 3,204,495.)

3,583,596, Solo Cup Company, LID; **Re. 28,797,** same, **filed** July 7, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c2441, *Solo Cup Corporation* v. *Sweetheart Cup Corporation.* Order of dismissal without prejudice filed Oct. 31, 1978.

3,589,495, Aircraft Mechanics, Inc., BRICK MAKING MACHINE; **3,716,264,** same, INFLATABLE GRIPPERS FOR BRICK MAKING MACHINES OR THE LIKE, **filed** Aug. 2, 1977, D.C., W.D.N.C. (Asheville), Doc. A–C–77–87, *AMI Industries, Inc.* v. *EA Industries, Inc.* Judgment filed May 25, 1979.

3,594,762, Stewart-Warner Corp., DISPLAY SYSTEM; **3,941,926,** same, VARIABLE INTENSITY DISPLAY DEVICE; **4,009,335,** same, GRAY SCALE DISPLAY SYSTEM EMPLOYING DIGITAL ENCODING; **4,148,073,** same, HIGH SPEED VIDEO DISPLAY SYSTEM INCLUDING ZOOM FEATURE, **filed** Sept. 13, 1979, D.C., E.D. Mich. (Detroit), Doc. 79–73536, *Stewart-Warner Corp.* v. *The City of Pontiac, Mich. et al.* **Same, filed** Oct. 26, 1979, D.C., W.D. Wash. (Seattle), Doc. C79–1264M, *American Sign & Indicator Corp.* v. *Stewart-Warner Corp.*

3,630,505, Byron R. MacKay, SILVER RECOVERY; **3,692,291,** Michael T. MacKay, same; **3,744,995,** Byron R. MacKay, same, **filed** Dec. 21, 1979, D.C., N.D. Iowa (Sioux City), Doc. 2C 79–4100, *Byron R. MacKay, Michael T. MacKay & B. R. MacKay & Sons, Inc.* v. *Robert Hoff and Tri-State Refining Company.*

3,675,705. (See 3,552,469.)

3,692,291. (See 3,630,505.)

3,711,085, Earnest R. Bunch, FOLDER FOR BUSINESS FORMS, **filed** Dec. 14, 1979, D.C. Ariz. (Phoenix), Doc. 79–1017–PHX–WPC, *B. Bunch Company* v. *Form Flo Equipment Manufacturers, Inc. et al.*

3,714,905, Franklin D. Barber, DAMPENED RAILING CAR TRUCK, **filed** Dec. 12, 1979, D.C., E.D. Pa. (Philadelphia), Doc. 79–4525, *Railroad Dynamics, Inc.* v. *Standard Car Truck Company.*

3,716,264. (See 3,589,495.)

3,738,217, Omark Industries, Inc., INSULATION HANGER, **filed** Apr. 30, 1979, D.C.N.J. (Camden), Doc. 79–1350, KSM, *Division of Omark Industries, Inc.* v. *H. S. Jones Company Incorporated.* Order of dismissal filed Nov. 28, 1979.

3,744,995. (See 3,630,505.)

3,753,040. (See 3,336,694.)

3,755,666. (See 3,336,694.)

3,756,139, John Wolens, POPCORN POPPER, **filed** Oct. 16, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c4291, *John Wolens* v. *Woolworth and J. C. Penney.* **Same, filed** Aug. 30, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c3576, *John Wolens* v. *K-Mart Corporation et al.* Cause dismissed with prejudice and without costs on Oct. 23, 1979.

3,758,051. (See 3,216,674.)

3,761,647, Kabushiki Kaisha Audio-Technica, CARTRIDGE FOR DETECTING VIBRATIONS REPRESENTING STEREOPHONIC SOUND; **4,075,418,** same, STEREOPHONIC PICKUP CARTRIDGE, **filed** Sept. 23, 1978, D.C. Del. (Wilmington), Doc. 78–400, *Atlantis Sound, Inc. et al.* v. *Kabushiki Kaisha Audio-Technica et al.* Minute order closing case for statistical purposes filed Sept. 20, 1979.

3,767,339, Denes B. Hunkar, INJECTION MOLDING CONTROL; **3,941,534,** same, INJECTION MOLDING CONTROL SYSTEM, **filed** Dec. 3, 1976, D.C., N.D. Ind. (South Bend), Doc. S76–206, *Hunkar Laboratories, Inc.* v. *Nyloncraft Incorporated.* Upon stipulation of dismissal pursuant to Rule 41(a)(1)(ii) FRCP, complaint and counterclaim dismissed without prejudice on Dec. 17, 1979.

3,794,922, Tocom, Inc., DATA SAMPLING COMMUNICATION SYSTEM; **3,803,491,** same, COMMUNICATIONS SYSTEM, **filed** Nov. 14, 1979, D.C., S.D. Tex. (Houston), Doc. H–79–2348, *Tocom, Inc.* v. *Houston Cable TV, Inc. and Warner Cable Corporation.*

3,797,779, Sony Corporation, TAPE CASSETTE; **3,900,170,** same; **3,900,171,** same; **3,900,172,** same; **3,921,927,** same, TAPE REEL; **3,934,839,** same, TAPE CASSETTE; **3,971,071,** same, TAPE CASSETTE WITH GUIDE MEANS FOR UNIDIRECTIONAL INSERTION AND HOLDER THEREFORE; **3,980,255,** same, TAPE CASSETTE; **4,091,168,** same, LEADER FOR MAGNETIC RECORDING TAPE HAVING COEXTENSIVE FLEXIBLE LAYERS WITH METAL LAMINATED THEREBETWEEN; **D. 247,778,** same, TAPE CASSETTE CASE, **filed** July 27, 1979, D.C., S.D. Fla. (Fort Lauderdale), Doc. 79–3310–C–NCR, *Sony Corporation* v. *Krimis Video, Inc.* Defendant is permanently enjoined from using plaintiff's patents. Sept. 18, 1979.

3,801,800, Valleylab, Inc., ISOLATING SWITCHING CIRCUIT FOR AN ELECTROSURGICAL GENERATOR, **filed** Sept. 27, 1979, D.C. Colo. (Denver), Doc. 79–Z–1336, *Valleylab, Inc.* v. *Aspen Laboratories, Inc.*

3,803,491. (See 3,794,922.)

3,806,852, The Stanley Works, SWITCH ACTIVATING HINGE, **filed** Dec. 4, 1979, D.C. Del. (Wilmington), Doc. 79–566, *The Stanley Works* v. *Rixson-Firemark, Inc.* **Same, filed** Dec. 4, 1979, D.C. Del. (Wilmington), Doc. 79–567, *The Stanley Works* v. *McKinney Manufacturing Company.*

3,839,640, John A. Rossin, DIFFERENTIAL PYROELECTRIC SENSOR, **filed** Dec. 21, 1979, D.C., C.D. Calif. (Los Angeles), Doc. 79–4952 WPC, *Rossin Corporation* v. *Solfan Systems, Inc.* **Same, filed** Jan. 8, 1980, D.C., M.D. Fla. (Orlando), Doc. 80–0011 Orl–C–R, *Rossin Corporation* v. *Eltec Instruments, Inc.*

3,841,011, Marine Construction & Design Co., LONG-LINE SETTING, BAITING AND HAULING SYSTEM AND APPARATUS; **3,903,632,** same, LONG LINE HAULING AND REEL STORAGE SYSTEM; **Re. 28,380,** same, FISH LINE REELING AND BAITING APPARATUS, **filed** Oct. 29, 1979, D.C., W.D. Wash. (Seattle), Doc. C–79–1269S, *Marine Construction & Design Co.* v. *Paul Meyer.*

3,841,011, Marine Construction & Design Co., LONG-LINE SETTING, BAITING AND HAULING SYSTEM AND APPARATUS; **Re. 28,380,** same, FISH LINE REELING AND BAITING APPARATUS, **filed** Nov. 1, 1979, D.C. Oreg. (Portland), Doc. 79–1328, *Marine Construction & Design Co.* v. *William Szabo and Dennis Ruud.*

3,841,057, New England Log Homes, Inc., PLANING AND GROOVING MACHINE, **filed** Nov. 15, 1979, D.C. Conn. (New Haven), Doc. N–79–430, *New England Log Homes, Inc.* v. *Country Log Homes, Inc. et al.*

3,846,968, Bigelow-Sanford, Inc., YARN STRUCTURE AND METHOD FOR PRODUCING SAME, **filed** Oct. 4, 1979, D.C., E.D. Tenn. (Greenville), Doc. CIV–2–79–171, *Bigelow-Sanford, Inc.* v. *Richard W. Sheehan et al.*

3,850,087, Landblom and Mecklenburg, CREPE GRIDDLE FOR MAKING THIN UNIFORM CREPES, **filed** Dec. 10, 1979, D.C. Minn. (Minneapolis), Doc. 4–79–C–619, *Creative Cookware, Inc.* v. *Northland Aluminum Products, Inc.*

3,851,609, Leathem S. Stearn, TWO GROOVE HEADSTAY, **filed** May 3, 1976, D.C., E.D. Mich. (Detroit), Doc. 76–70907, *Leathem S. Stearn* v. *Hood Sailmakers, Inc. et al.* Judgment rendered on Dec. 10, 1979.

3,882,824, Gwendolyn Acquaviva, GROOMING AID FOR HAIRY ANIMALS, **filed** Dec. 21, 1979, D.C., N.D. Ohio (Cleveland), Doc. 79–2338A, *Gwendolyn Acquaviva* v. *W. F. Young, Inc.* **Same, filed** Dec. 21, 1979, D.C., N.D. Ohio (Cleveland), Doc. 79–2339A, *A.T.S. Laboratories, Inc.* v. *W. F. Young, Inc.*

3,900,170. (See 3,797,779.)

3,900,171. (See 3,797,779.)

3,900,172. (See 3,797,779.)

3,903,632. (See 3,841,011.)

3,908,874. (See 3,327,664.)

3,921,927. (See 3,797,779.)

3,934,839. (See 3,797,779.)

3,935,106, Herbert Lipner, WATER FILTER ASSEMBLY, **filed** July 26, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c3087, *OMNI* v. *Brunswick Corporation et al.* Cause dismissed for want of prosecution on Dec. 26, 1979.

3,941,534. (See 3,767,339.)

3,941,926. (See 3,594,762.)

3,956,540, Omnitech Inc., METHOD OF COATING ARTICLES, **filed** Nov. 30, 1979, D.C., C.D. Calif. (Los Angeles), Doc. 79–04628, *Omnitech Inc.* v. *Techsight Corporation et al.*

3,964,373, Christen Incorporated, PAPER LOG ROLLER; **D. 237,141,** same, **filed** Dec. 17, 1979, D.C., E.D. Pa. (Philadelphia), Doc. CA 79–4593, *Christen Incorporated* v. *Robbins Jewelers & Distributors, Inc.* **Same, filed** Dec. 19, 1979 D.C., W.D. Tenn. (Memphis), Doc. 79–2813–M, *Christen Incorporated* v. *Fred P. Gattas Company, Inc.* **Same, filed** Dec. 26, 1979, D.C., C.D. Ill. (Peoria), Doc. 79–1181, *Christen Incorporated* v. *Peoria Suppliers*

3,968,263, Spitzer and Osipow, AEROSOL ASTRINGENT SYSTEMS, **filed** Oct. 20, 1977, D.C. Mass. (Boston), Doc. 77–3186–T, *Carter-Wallace, Inc.* v. *The Gillette Company.*

3,970,750, Sandoz, Inc., EFFERVESCENT POTASSIUM CHLORIDE COMPOSITION, **filed** May 18, 1979, D.C., S.D. Ind. (Evansville), Doc. EV–79–86–C, *Sandoz, Inc.* v. *Mead-Johnson Company.* Judgment entered Dec. 10, 1979.

3,971,071. (See 3,797,779.)

3,980,255. (See 3,797,779.)

3,995,102, Raceway Components, Inc., INSERT DEVICE FOR CABLES, **filed** Dec. 20, 1979, D.C.N.J. (Newark), Doc. 79–3610, *Raceway Components, Inc.* v. *Square D. Company, Inc.*

3,997,923, Zinon C. Possis, HEART VALVE PROSTHESIS AND SUTURING ASSEMBLY AND METHOD OF IMPLANTING A HEART VALVE PROSTHESIS IN A HEART; **4,078,268,** same, HEART VALVE PROSTHESIS, **filed** Dec. 26, 1979, D.C. Minn. (Minneapolis), Doc. 4–79–C–462, *Possis Corporation* v. *St. Jude Medical, Inc.*

3,999,748, William A. Clarke, CHILDRENS GAME OF CATCH; **4,029,316,** same, GAME BALL, **filed** Sept. 27, 1977, D.C., W.D. Pa. (Erie), Doc. 77–132 Erie, *William A. Clarke* v. *K-Mart.* Judgment entered in favor of defendants on Dec. 14, 1979.

4,000,335. (See 3,594,762.)

4,018,135, Lance and James, HYDRAULICALLY POWERED IMPACT DEVICE, **filed** Dec. 17, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c5285, *Consolidated Technologies Corporation* v. *Justus Manufacturing, Inc.*

4,029,316. (See 3,999,748.)

4,043,326, Little and Cloud, Jr., WATERPROOF CAST PROTECTOR; **4,139,003,** same, **filed** Apr. 20, 1979, D.C., C.D. Calif. (Los Angeles), Doc. 79–1444 RJK (Kx), *Little & Co.* v. *Robert Wittman et al.*

4,066,851. (See 3,383,487.)

4,075,418. (See 3,761,647.)

4,078,268. (See 3,997,923.)

4,091,168. (See 3,797,779.)

4,126,145, Raymond Boyd, LIGHTED COMPACT, **filed** Nov. 28, 1979, D.C.N.J. (Camden), Doc. 79–3411, *Raymond Boyd* v. *Strawbridge & Clothier.*

4,127,975, Thomas E. Judkins, CONCEALED FASTENERS FOR WALL PANELS, **filed** May 1, 1979, D.C., N.D.N.Y. (Utica), Doc. 79–CV–294, *Thomas E. Judkins* v. *Roger Neil Weinar et al.* Stipulation of dismissal filed Nov. 19, 1979.

4,139,003. (See 4,043,326.)

4,148,973. (See 3,594,762.)

4,149,513, Howard P. Gooden, METHOD OF TEXTURING CONCRETE WITH DEEP TEXTURE HAMMER, **filed** Sept. 21, 1979, D.C., N.D. Ga. (Atlanta), Doc. C79–1774A, *Goodwall Construction Company, Inc.* v. *Beers Construction Company et al.*

Re. 26,887. (See 3,216,674.)

Re. 28,380. (See 3,841,011.)

Re. 28,563, Winalee G. Mitchell and James G. Mitchell, METHOD FOR FABRICATION OF PLASTIC FOOTWEAR; **D. 200,897,** Winalee G. Mitchell, SLIPPER, **filed** Oct. 10, 1979, U.S. Court of Claims (Washington, D.C.), Doc. 457–79, *Principal Business Enterprises, Inc. et al.* v. *The United States.*

Re. 28,685, Carding Specialists (Canada) Limited, METHOD AND APPARATUS FOR THE TREATMENT OF COTTON FIBERS, **filed** Mar. 26, 1976, D.C., M.D.N.C. (Durham), Doc. C–76–144–D, *Carding Specialists (Canada) Limited* v. *Gunter & Cooke, Inc.* Stipulation of dismissal filed Dec. 14, 1979.

Re. 28,797. (See 3,583,596.)

D. 200,897. (See Re. 28,563.)

D. 226,388, Creative Creations Inc., TOY SPINNER WITH OPENABLE PETALS, **filed** Oct. 26, 1979, D.C., S.D.N.Y., Doc. 79–C–5821, *Creative Creations Inc.* v. *Walgreen Eastern Co. Inc.*

D. 237,141. (See 3,964,373.)

D. 247,778. (See 3,797,779.)

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,969,780, Re. S.N. 100,211, Filed Dec. 14, 1979, Cl. 8/149.1, CONTINUOUS CARPET DYING PROCESS, James M. Henderson, Owner of Record: *Inventor,* Attorney or Agent: Harold D. James Jr., et al., Ex. Gp.: 242

3,992,064, Re. S.N. 946,491, Filed Sep. 28, 1978, Cl. 303/7, VEHICLE BRAKE SYSTEM, Michael L. Carton, et al., Owner of Record: *Wagner Electric Corporation, Wilmington, Del.,* Attorney or Agent: William D. Lucas, et al., Ex. Gp.: 315

4,062,170, Re. S.N. 102,815, Filed Dec. 12, 1979, Cl. 53/390, APPARATUS FOR LOADING BAGS, William George Orem, Owner of Record: *Mobil Oil Corporation, New York, N.Y.,* Attorney or Agent: Charles A. Huggett, et al., Ex. Gp.: 324

4,064,918, Re. S.N. 100,119, Filed Dec. 4, 1979, Cl. 140/123.6, STRAP TENSION SENSING AND CUTOFF MECHANISM, Walter Pobuta, et al., Owner of Record: *Thomas & Betts Corporation, Elizabeth, N.J.,* Attorney or Agent: James J. Daley, et al., Ex. Gp.: 321

4,082,981, Re. S.N. 100,314, Filed Dec. 4, 1979, Cl. 315/97, ENERGY SAVING DEVICE FOR A STANDARD FLUORESCENT LAMP SYSTEM, Edward W. Morton, et al., Owner of Record: *Westinghouse Electric Corporation, Pittsburgh, Pa.,* Attorney or Agent: C. L. Mc Hale, et al., Ex. Gp.: 256

4,144,312, Re. S.N. 102,170, Filed Dec. 10, 1979, Cl. 423/178, DESULFURIZATION OF FLOURITE ORES, Claude H. P. Lupis, Owner of Record: *Inventor,* Attorney or Agent: Richard Wiener, Ex. Gp.: 113

4,144,723, Re. S.N. 102,957, Filed Dec. 12, 1979, Cl. 62/332, POWER PLANT SECONDARY COOLANT CIRCUIT, David C. Morse, et al., Owner of Record: *General Atomic Co., San Diego, Calif.,* Attorney or Agent: William E. Anderson, et al., Ex. Gp.: 344

PATENT NOTICES

Certificates of Correction for March 4, 1980

Re. 30,117	4,105,776	4,159,684	4,170,602
D 247,403	4,119,717	4,159,912	4,170,695
3,905,953	4,120,947	4,160,149	4,170,834
3,947,198	4,121,930	4,160,668	4,171,129
3,947,510	4,124,000	4,160,731	4,171,378
3,947,808	4,126,568	4,161,924	4,171,624
3,957,950	4,128,257	4,162,484	4,172,511
4,017,143	4,129,384	4,162,975	4,172,621
4,035,585	4,129,569	4,163,122	4,172,757
4,047,965	4,132,858	4,163,747	4,172,781
4,062,881	4,138,391	4,164,490	4,173,771
4,069,190	4,143,145	4,164,498	4,173,793
4,072,740	4,144,152	4,164,709	4,173,925
4,073,712	4,146,617	4,165,063	4,174,496
4,081,951	4,147,238	4,165,627	4,174,920
4,092,033	4,148,984	4,166,750	4,175,148
4,096,711	4,152,101	4,167,105	4,175,928
4,097,511	4,153,570	4,167,610	4,176,012
4,098,570	4,156,149	4,168,339	4,176,247
4,100,159	4,159,046	4,168,373	4,176,485
4,104,997	4,159,612	4,170,297	4,177,410

Dedications

3,077,971.—*Leon E. Palmer*, Lexington, Ky. CASE SHIFT INTERLOCK FOR TYPEWRITER. Patent dated Feb. 19, 1973. Dedication filed Dec. 5, 1979, by the assignee, *International Business Machines Corporation.*

Hereby dedicates to the Public the remaining term of said patent.

3,512,723.—*Jacques A. Geoffroy*, Forbach, France. INSTALLATION FOR SIMULTANEOUSLY DRYING PULVERISING AND GRADING GRANULAR MATERIALS. Patent dated May 19, 1970. Dedication filed Dec. 20, 1979, by the assignee, *Charbonnages De France.*

Hereby dedicates to the Public the remaining term of said patent.

Disclaimers

3,078,172.—*Louis L. Libby*, Forest Hills, N.Y. PREPARED FROZEN FOOD FOR COOKING AND METHOD OF PREPARING THE SAME. Patent dated Feb. 19, 1963. Disclaimer filed Dec. 10, 1979, by the assignee, *Tra-Way Corp.*

Hereby enters this disclaimer to the remaining term of said patent.

4,052,320.—*Raymond F. Jakubowicz*, Manchester, N.Y. TELESCOPING SERUM SEPARATOR AND DISPENSER. Patent dated Oct. 4, 1977. Disclaimer filed Nov. 28, 1979, by the assignee, *Eastman Kodak Company.*

Hereby enters this disclaimer to claims 2–5 and 8–13 of said patent.

4,164,417.—*Robert Abdon Gustison*, Reading, Pa. PROCESS FOR RECOVERY OF NIOBIUM VALUES FOR USE IN PREPARING NIOBIUM ALLOY PRODUCTS. Patent dated Aug. 14, 1979. Disclaimer filed Dec. 21, 1979, by the assignee, *Kawecki Berylco Industries, Inc.*

Hereby enters this disclaimer to claim 9 of said patent.

National Technical Information Service

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Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $4.00 ($8.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF THE AIR FORCE
AFJACP, 1900 Half St., SW., Washington, D.C. 20324

Patent application 6–035,574. Low friction Servo Valve. Filed May 3, 1979.

Patent application 6–042,470. Fluidic Pressure Ratio Sensor. Filed May 25, 1979.

Patent application 6–043,982. High Piezoelectric Coupling X-Cuts of Lead Potassium Niobate, Pb2 KNb5015, for Surface Acoustic Wave Applications. Filed May 31, 1979.

Patent application 6–048,874. Multiple Diameter Wire Bundle Support. Filed June 15, 1979.

Patent application 6–048,875. Laser Tensile Test Sample Holder. Filed June 15, 1979.

Patent application 968,873. Alloy for Brazing Silicone to Metal. Filed Dec. 22, 1979.

Patent 4,161,041. Pseudo Random Number Generator Apparatus. Filed Oct. 6, 1978. Patented July 10, 1979. Not available NTIS.

Patent 4,161,434. Method for Separating Trialuminum Nickelide Fibers from an Aluminum Matrix. Filed Oct. 12, 1978. Patented July 17, 1979. Not available NTIS.

Patent 4,161,826. Method of Deagglomeration of Aluminum Powder. Filed Mar. 9, 1978. Patented July 24, 1979. Not available NTIS.

Patent 4,162,222. Grease Compositions. Filed Aug. 15, 1978. Patented July 24, 1979. Not available NTIS.

Patent 4,162,777. Canted Spar with Intermediate Intercostal Stiffeners. Filed May 2, 1978. Patented July 31, 1979. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE
Program Agreements and Patent Branch, Administrative Service Division, Federal Bldg., Science and Education Administration, Hyattsville, Md. 20782

Patent 4,141,174. Quantitative Apparatus for Sampling Athropods Associated With Field Crops. Filed May 27, 1977. Patented Feb. 27, 1979. Not available NTIS.

Patent 4,141,302. Furrow Opener and Apparatus for No-Tillage Transplanters and Planters. Filed Oct. 21, 1977. Patented Feb. 27, 1979. Not available NTIS.

Patent 4,146,705. Method for Increasing Solution Viscosity of 'Arthrobacter stabilis' Polysaccharides. Filed June 17, 1977. Patented Mar. 27, 1979. Not available NTIS.

Patent 4,152,199. Interpolymer Paper Strength Additives. Filed May 30, 1975. Patented May 1, 1979. Not available NTIS.

Patent 4,152,214. Production of Homodeoxyharringtonine and Other Cephalotaxine Esters by Tissue Culture. Filed Oct. 7, 1977. Patented May 1, 1979. Not available NTIS.

Patent 4,152,278. Wax Esters of Vegetable Oil Fatty Acids Useful as Lubricants. Filed May 19, 1978. Patented May 1, 1979. Not available NTIS.

Patent 4,152,333. Synthetic Cephalotaxine Esters Having Antileukemic Activity. Filed Feb. 22, 1978. Patented May 1, 1979. Not available NTIS.

Patent 4,152,422. Attractant for Male Mediterranean Fruit Fly. Filed Feb. 3, 1978. Patented May 1, 1979. Not available NTIS.

U.S. ENVIRONMENTAL PROTECTION AGENCY
Room W513, 401 M St., SW., Washington, D.C. 20460

Patent application 6–015,079. Process for Fixing Arsenic Bearing Materials and Arsenic Containing Composites Formed by Said Process. Filed Feb. 26, 1979.

Patent application 798,544. Fluidized Bed Systems. Filed May 19, 1977.

Patent application 876,099. Hopper. Filed Feb. 8, 1978.

Patent application 882,673. Method of and Apparatus for Reducing Back Corona Effects. Filed Mar. 2, 1978.

Patent 3,923,174. Non-Stop Refuse Collection Container. Filed July 22, 1974. Patented Dec. 2, 1975. Not available NTIS.

Patent 4,033,177. Solid Fuel Fired Gas Turbine System Having Continuously Regenerating Granular Filter. Filed Jan. 8, 1976. Patented July 5, 1977. Not available NTIS.

Patent 4,138,880. Vapor Emission Recovery and Measuring Method and Vapor Recovery Collection Boot. Filed May 27, 1977. Patented Feb. 13, 1979. Not available NTIS.

Patent 4,153,020. Method and Apparatus for Spark Control of Engine Knock. Filed July 26, 1977. Patented May 8, 1979. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
National Institutes of Health Chief, Patent Branch
Westwood Bldg., Bethesda, Md. 20205

Patent application 6–030,315. Synthesis of Optically Pure Thromboxanes. Filed Apr. 16, 1979.

Patent application 6–031,749. Synthesis of 4a-aryldecahydroisoquinolines. Filed Apr. 20, 1979.

Patent application 964,969. Method and Apparatus for Destroying Organic Matter to Facilitate Trace Inorganic Element Analysis. Filed Nov. 30, 1978.

U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, 18th and C Sts., NW.
Washington, D.C. 20240

Patent application 6–037,089. Regeneration of Waste Metallurgical Process Liquor. Filed May 8, 1979.

Patent application 6–044,434. Process for Recovering Ni(II), Cu(II) and Co(II) From an Ammoniacal-Ammonium Sulfate Leach Liquor. Filed June 1, 1979.

Patent application 6–044,814. Process for Extracting Uranium Values From a Uranium-Containing Carbonaceous Ore. Filed June 1, 1979.

Patent 4,156,656. Preparation of Hydrosulfides. Filed June 13, 1978. Patented May 29, 1979. Not available NTIS.

Patent 4,157,204. Face Ventilation System for Coal Mines. Filed July 27, 1978. Patented June 5, 1979. Not available NTIS.

Patent 4,157,371. Method of Agglomerating Fine Powders. Filed Mar. 19, 1975. Patented June 5, 1979. Not available NTIS.

OFFICE OF NAVAL RESEARCH
Field Support Group, Room 221,
Arlington, Va. 22217

Patent 4,107,401. Super High Energy Density Battery. Filed Jan. 24, 1978. Patented Aug. 15, 1978. Not available NTIS.

Patent 4,148,514. Tension Release Latch. Filed June 30, 1975. Patented Apr. 10, 1979. Not available NTIS.

Patent 4,150,346. Acoustic Periodic Structure. Filed Nov. 9, 1977. Patented Apr. 17, 1979. Not available NTIS.

Patent 4,156,106. Multiplex-Data Bus Modulator/Demodulator. Filed Dec. 22, 1977. Patented May 22, 1979. Not available NTIS.

Patent 4,156,824. Composite Low Frequency Transducer. Filed Dec. 15, 1977. Patented May 29, 1979. Not available NTIS.

Patent 4,158,368. Magnet Ostrictive Transducer. Filed May 12, 1976. Patented June 19, 1979. Not available NTIS.

Patent 4,160,169. Parallel Scanning System. Filed Feb. 13, 1978. Patented July 3, 1979. Not available NTIS.

Patent 4,160,314. Degraining, a Three Step Process To Obtain Propellant Samples From Case Bonded Motors. Filed Apr. 28, 1978. Patented July 10, 1979. Not available NTIS.

Patent 4,161,691. Multi-Purpose Digital Measuring Apparatus. Filed Mar. 6, 1978. Patented July 17, 1979. Not available NTIS.

Patent 4,161,780. Spin Rate Timing System. Filed June 23, 1978. Patented July 17, 1979. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters—NASA
Code GP–4, Washington, D.C. 20546

Patent application 6–027,558. Direction Sensitive Laser Velocimeter. Filed Apr. 6, 1979.

Patent application 6–060,435. Solar Tracking System. Filed Feb. 25, 1979.

Patent application 6–061,327. Serial Data Correlator/Code Translator. Filed July 27, 1979.

Patent 4,033,286. Chemical Vapor Deposition Reactor. Filed July 12, 1976. Patented July 5, 1977. Not available NTIS.

Patent 4,159,262. Catalytic Trimerization of Aromatic Nitriles and Triaryl-S-Triazine Ring Cross-Linked High Temperature Resistant Polymers and Copolymers Made Thereby. Filed May 12, 1977. Patented June 26, 1979. Not available NTIS.

Patent 4,159,634. Toggle Mechanism for Pinching Metal Tubes. Filed May 19, 1978. Patented July 3, 1979. Not available NTIS.

Patent 4,160,254. Microwave Dichroic Plate. Filed Feb. 16, 1978. Patented July 3, 1979. Not available NTIS.

Patent 4,160,508. Controller Arm for a Remotely Related Slave Arm. Filed Aug. 19, 1977. Patented July 10, 1979. Not available NTIS.

Patent 4,161,661. System for Automatically Switching Transformer Coupled Lines. Filed Mar. 9, 1978. Patented July 17, 1979. Not available NTIS.

Patent 4,161,731. Thickness Measurement System. Filed Oct. 31, 1977. Patented July 17, 1979. Not available NTIS.

Patent 4,161,747. Shock Isolator for Operating a Diode Laser on a Closed-Cycle Refrigerator. Filed Feb. 24, 1978. Patented July 17, 1979. Not available NTIS.

U.S. DEPARTMENT OF THE AIR FORCE AF/JACP
1900 Half St., SW., Washington, D.C. 20324

Patent application 6–035,743. Target Discrimination Apparatus. Filed May 3, 1979.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
National Institutes of Health, Chief, Patent Branch
Westwood Bldg., Bethesda. Md. 20205

Patent application 6–022,220. Sterility Testing Vessel. Filed Mar. 19, 1979.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

Patent application 6–032,316. Swash-Plate Pump With Improved Inlet Porting. Filed Apr. 23, 1979.

Patent application 6–042,170. Ejection Seat With Pitch, Roll and Yaw Control. Filed May 24, 1979.

Patent application 6–043,188. Aliphatic Pheroxy Polyphthalocyanine. Filed May 29, 1979.

Patent 4,119,962. Multiple Memory Adaptive MTI. Filed Nov. 23, 1977. Patented Oct. 10, 1978. Not available NTIS.

Patent 4,133,204. Roughness Diagnostic Tool. Filed May 15, 1978. Patented Jan. 9, 1979. Not available NTIS.

Patent 4,141,274. Weather Modification Automatic Cartridge Dispenser. Filed Oct. 14, 1977. Patented Feb. 27, 1979. Not available NTIS.

Patent 4,141,275. Afterburner Recoilless Rifle. Filed July 14, 1977. Patented Feb. 27, 1979. Not available NTIS.

Patent 4,147,055. Apparatus for Determining Projectile Position and Barrel Pressure Characteristics. Filed Dec. 15, 1977. Patented Apr. 3, 1979. Not available NTIS.

Patent 4,147,124. Apparatus for Launching Stores From a Submerged Vehicle. Filed Sept. 26, 1977. Patented Apr. 3, 1979. Not available NTIS.

Patent 4,150,875. Pressure-Resistant Housing. Filed Sept. 23, 1977. Patented Apr. 24, 1979. Not available NTIS.

Patent 4,151,393. Laser Pile Cutter. Filed Feb. 13, 1978. Patented Apr. 24, 1979. Not available NTIS.

Patent 4,154,185. Submersible Apparatus for Evacuating Seawater From Suction-Type Work-Handling Gripper Members. Filed Oct. 11, 1977. Patented May 15, 1979. Not available NTIS.

Patent 4,156,286. Solid State Data Recorder. Filed Nov. 16, 1977. Patented May 22, 1979. Not available NTIS.

Patent 4,158,322. Pyrotechnic Separation Device. Filed Aug. 22, 1977. Patented June 19, 1979. Not available NTIS.

Patent 4,158,447. Expanding Stabilizing Fin Cup. Filed Nov. 29, 1977. Patented June 19, 1979. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters—NASA
Code GP–2, Washington, D.C. 20546

Patent application 6–043,942. A System for Providing an Integrated Display of Instantaneous Information Relative to Aircraft Attitude, Heading, Altitude, and Horizontal Situation. Filed May 30, 1979.

Patent application 6-008,210. A Cooling System for an Aircraft Having a Cruise Range From Mach 2 to Mach 8. Filed Jan. 31, 1979.

Patent application 6-014,663. Foldable Beam. Filed Feb. 23, 1979.

Patent application 6-017,889. Helicopter Rotor Airfoil. Filed Mar. 6, 1979.

Patent application 6-023,501. Heat Treat Fixture. Filed Mar. 23, 1979.

Patent application 6-027,557. Polyimide Predreg Material Having Improved Tack Retention. Filed Apr. 6, 1979.

Patent application 6-030,964. Rotary Target V-Block. Filed Apr. 17, 1979.

Patent application 6-037,072. Method and Apparatus for Producing Concentric Hollow Spheres. Filed May 8, 1979.

Patent application 6-043,911. An Annular Wing. Filed May 30, 1979.

Patent application 6-043,945. Lightning Discharge Identification System. Filed May 30, 1979.

Patent 4,148,962. Fibrous Refractory Composite Insulation. Filed Sept. 8, 1978. Patented Apr. 10, 1979. Not available NTIS.

Patent 4,151,800. Thermal Insulation Protection Means. Filed Apr. 15, 1977. Patented May 1, 1979. Not available NTIS.

Patent 4,154,256. Self Stabiliz'ng Sonic Inlet. Filed Mar. 29, 1978. Patented May 15, 1979. Not available NTIS.

Patent 4,155,475. Bonding of Sapphire to Sapphire by Eutectic Mixture of Aluminum Oxide and Zirconium Oxide. Filed Dec. 30, 1975. Patented May 22, 1979. Not available NTIS

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

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Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

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Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
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	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 26, 1980

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—R. FRIEDMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy: Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-2-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-3-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-14-79
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director. Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	5-8-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-8-79
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	5-25-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	11-16-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	4-16-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	1-29-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-20-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	3-13-78
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	12-14-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	12-14-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	1-8-79
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	8-22-78
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director. Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Misc. Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	8-17-78

Expiration of patents: The patents within the range of numbers indicated below expire during January 1980, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,070,801 to 3,076,194, inclusive
Plant Patents ..... Numbers 2,208 to 2,223, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED MARCH 4, 1980

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T991,001
PREFORMED HOT-MELT SEALANT STRIP

Leonard D. Donovan, 12 High St., Southboro, Mass. 01772, and Matthew M. Sitter, 22 Colonial Dr., Convert Station, N.J. 07961

Filed Mar. 9, 1979, Ser. No. 19,270
Int. Cl.[2] B32B *17/10*; C09J *7/02*; C03C *27/10*
U.S. Cl. 428—40
No Drawing. 7 Pages Specification

A preformed or prefabricated hot melt sealant strip of essentially any desired length and with any desired cross-sectional configuration is formed by hot extrusion, cooled, and coiled or spooled and may be subsequently used, for example, as a sealing means in the assembly of multiglazed windows, to seal and set automobile windshields and the like. The preferred cross-section is U-shaped if the sealant strip is to be utilized for multiglazed windows but the strip may have a T, E, L shape, or the like, depending on the intended end use. Any hot melt adhesive or sealant composition is suitable as long as it is not too tacky in the cooled state. Some tackiness is acceptable but it requires the use of an abherent or release liner if the strip is to be packaged in such a manner that it is in contact with itself. The sealant strip may then be placed about a dessicant filled spacer element and located between two panes of glass. The sealant may then be activated by subjection to thermal energy to seal the unit.

T991,002
COATING COMPOSITION

Don R. Leonard, Rte. 15, 421 Old Castle Rd., Kingsport, Tenn. 37660

Filed Feb. 21, 1979, Ser. No. 13,112
Int. Cl.[2] C08L *1/14*
U.S. Cl. 260—15
No Drawing. 9 Pages Specification

Disclosed are aqueous emulsion coating compositions comprising a thermosetting polyester resin, cellulose ester, melamine-formaldehyde crosslinking agent, a combination surfactant-curing agent and a suitable organic solvent. The cellulose ester is preferably cellulose acetate butyrate. The combination surfactant-curing agent is preferably ammonia- or amine-neutralized salts of sulfonated, ethoxylated hydrocarbons. The concentrate is emulsified in water and used as a coating composition. The coating has low solvent emission to the atmosphere when drying, provides a hard but flexible coating having excellent appearance, good durability, and rapid drying properties.

REISSUES

MARCH 4, 1980

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,223

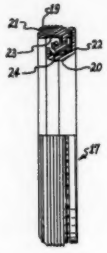
LUBRICANT SEAL

David B. Prescott, Littleton; Herbert H. Thumm, Denver, and Raymond L. Horner, Englewood, all of Colo., assignors to The Mechanex Corporation, Englewood, Colo.

Original No. 4,037,848, dated Jul. 26, 1977, Ser. No. 657,094, Feb. 11, 1976. Application for reissue Nov. 13, 1978, Ser. No. 959,941

Int. Cl.² F16J *15/32*

U.S. Cl. 277—37 13 Claims



1. A seal for sealing between a bore and a shaft, said shaft being radially inwardly spaced from and coaxial with said bore and said bore and said shaft being subject to rotation relative to each other, said seal comprising;

a first substantially annular means having a first resilient elastomeric member adapted for sealingly engaging a continuous annular portion of said bore for preventing fluid flow between said bore and said resilient elastomeric member, said resilient elastomeric member being adapted for being installed into sealing engagement with said continuous annular portion of said bore by manual effort for enabling said seal to be sealingly engaged with said bore without installation tools;

a second substantially annular means having a second resilient elastomeric member adapted for sealingly engaging a continuous annular portion of said shaft for preventing fluid flow between said second resilient elastomeric member and said shaft, said resilient elastomeric member being adapted for being installed into sealing engagement with said continuous annular portion of said shaft by manual effort for enabling said seal to be sealingly engaged with said shaft without installation tools;

one of said first and second annular means further having a first rigid member, said first rigid member having a cylindrical band portion sealingly engaged with said one of said first and second annular means and a rigid wear surface radially facing toward said other of said first and second annular means, said cylindrical band portion of said first rigid member having a first side and a second side, said first rigid member further having a rigid side member affixed to said first [end] *side* of said cylindrical band portion of said first rigid member and extending radially toward said other of said first and said second annular means, said rigid side member extending radially beyond a continuous annular portion of an axial side of said other of said first and said second annular means for limiting axial movement of said first and said second annular means relative to each other in a first axial direction;

the other of said first and said second means further having a second rigid member for supporting said resilient elastomeric member of said other of said first and second annular means;

said one of said first and said second annular means further having an assembly maintenance rim disposed adjacent said second side of said cylindrical band portion of said first rigid member, said assembly maintenance rim radially extending beyond said wear surface of said cylindrical band portion of said first rigid member toward said other of said first and said second annular means, said assembly maintenance rim having a terminal radially facing portion having a spaced relationship relative to said second rigid member of said other of said first and said second annular means to provide a continuous substantially annular space between said second rigid member and said terminal radially facing portion of said assembly maintenance rim for enabling said second rigid member to move axially past said assembly maintenance rim when said first and said second annular means are coaxially aligned and forced axially toward each other; and

the other of said first and said second annular means further having resilient seal means sealingly engaged with said other of said annular means and adapted for being sealingly engaged with a continuous annular portion of said wear surface for permitting relative rotational movement between said seal means and said wear surface and for preventing fluid flow between said seal means and said wear surface under static and dynamic conditions, said resilient seal means being adapted for resiliently deforming as it is forced axially into engagement with said assembly maintenance rim as said first and said second annular means are coaxially aligned with said seal means adjacent said assembly maintenance rim and forced axially toward each other whereby said seal means resiliently deforms to slide over said terminal radially facing portion of said assembly maintenance rim and upon being forced axially past said assembly maintenance rim said seal means resiliently returns toward its original shape for sealingly engaging said wear surface and for limiting axial movement of said first and said second annular means in a second axial direction, said second axial direction being opposite to said first axial direction, for maintaining said seal as a preassembled unit.

PLANT PATENTS

GRANTED MARCH 4, 1980

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,507

CN7 STRAWBERRY PLANT

Royce S. Bringhurst, Davis, and Victor Voth, Santa Ana, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Oct. 23, 1978, Ser. No. 954,005

Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—49 **1 Claim**

1. The new and distinct variety of strawberry plant herein described and illustrated and identified by the characteristics enumerated above.

4,508

PEACH TREE

Chris F. Zaiger, 537 Rosemore Ave., Modesto, Calif. 95351

Filed Dec. 19, 1978, Ser. No. 774

Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree as described and illustrated, characterized by its large size, vigor, upright growth; and being a regular and productive bearer of large, firm, yellow flesh, freestone fruit with excellent eating and shipping quality; it is further characterized by having fruit that colors two to three weeks before maturity and having a more attractive red skin color than other late season varieties, ripening two weeks after O'Henry Peach (U.S. Plant Pat. No. 2,964).

PLANT PATENTS

GRANTED MARCH 4, 1980

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawings.

4,527

CINQUEFOIL PLANT

Roger S. Hodgson, Davis, and Vivian Tech, Santa Ana, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Oct. 23, 1978, Ser. No. 953,806

Int. Cl.[2] A01H 5/00

U.S. Cl. PP.—49 1 Claim

1. The new and distinct variety of cinquefoil plant herein described and illustrated and identified by the aforementioned above.

4,528

PEACH TREE

Clare P. Mann, 527 Hammon Ave., Modesto, Calif. 95351

Filed Dec. 18, 1978, Ser. No. 970,374

Int. Cl.[2] A01H 5/00

U.S. Cl. PP.—43 1 Claim

1. A new and distinct variety of peach tree, substantially as illustrated. Characterized by its large, attractive, yellow flesh, freestone fruit with excellent eating and shipping quality, a yellow skin blushed by varying red that coloring two to three weeks before Fay Elberta. Plum Pit. Peach, and skin color that either like season varying ripening two weeks after O'Henry Peach (U.S. Plant Pat. No. 2,904).

PATENTS

GRANTED MAR. 4, 1980

ERRATA

For CLASS	See PATENT NO.
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046–161	4,190,982
410–110	4,191,108
410–149	4,191,109
126–427	4,191,329
024–016 PB	4,191,334
280–166	4,191,388
430–037	4,191,566
430–064	4,191,567
430–066	4,191,568
430–305	4,191,569
430–302	4,191,570
430–325	4,191,571
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GRANTED MAR. 4, 1980

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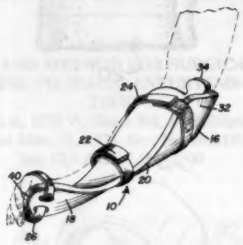
PATENTS

GRANTED MARCH 4, 1980

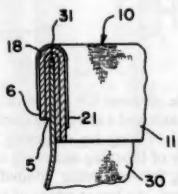
GENERAL AND MECHANICAL

4,190,902
PROTECTIVE DEVICE FOR THE ELBOW, ARM, PALM AND HAND
Jhoon G. Rhee, 4068 Rosamora Ct., Arlington, Va. 22207
Filed Mar. 9, 1978, Ser. No. 885,029
Int. Cl.[2] A41D *13/08*
U.S. Cl. 2—16 **10 Claims**



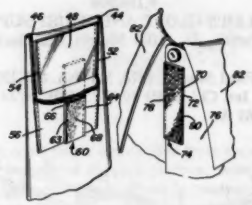
1. A flexible, unitarily molded, protective device for wearing on and protecting the elbow, arm, hand and palm of a person engaging in the sport of skateboarding comprising:
   a. resilient means having a generally longitudinal contoured configuration adapted to extend between the elbow and palm of the wearer;
   b. an elbow end comprising contoured portions adapted to cradle the person's elbow and to permit free movement of the upper part of the wearer's arm therein and to accommodate normal bending of the elbow;
   c. a palm end comprising a flat portion adapted to cover the palm of the wearer's hand while permitting free movement of the fingers and thumb;
   d. an intermediate narrower arm portion adapted to cover the back of the arm and to permit free movement of the wrist of the wearer;
   e. securing means for retaining said device on the arm and on the hand of the wearer.

4,190,903
NECK PROTECTOR
Florence A. Kinsella, 2515 First St., Apt. 47, Ft. Myers, Fla. 33901
Filed Sep. 1, 1978, Ser. No. 938,868
Int. Cl.[2] A41D *27/12*
U.S. Cl. 2—60 **1 Claim**



1. A neck protector comprising:
   (a) a neck band of fluid absorbent material for placement about a neck in overlapping relationship at opposite ends thereof for at least a portion of said neck,
      (i) said band having a length along a longitudinal axis of said band greater than the circumference of said neck so that said neck band overlaps said neck at opposite ends thereof within a first region at one end of said band and a second region at the other end of said band,
      (ii) said band being foldable proximal to said longitudinal axis so that when said band is folded thereat its width is less than the length of said neck.
   (b) at least one wire which may be bent along its longitudinal axis into a deformed state, and
   (c) adhesive means for fixing said one wire to said band transverse to said longitudinal axis of said band at one of said ends in one of said first and second regions so that said band is retained in said overlapping relationship when said wire is deformed into said deformed state.

4,190,904
SASH TIE AND HOLDER
David J. Nelson, 306 S. 3rd St., Burlington, Iowa 52601
Filed Aug. 30, 1978, Ser. No. 937,995
Int. Cl.[2] A41B *1/18*; A41D *25/10*
U.S. Cl. 2—137 **10 Claims**

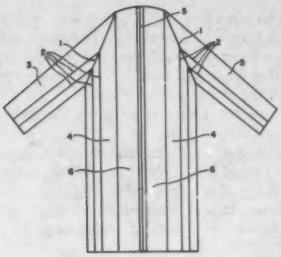


1. An item of clothing for a wearer comprising in combination a sash tie, a holder for the sash tie with tie fastening means on the sash tie or holder, and a shirt having a collar and shirt fastening means attached to the front portion of the shirt and removably engageable with said tie fastening means when the shirt is buttoned to the collar, the sash tie comprising a folded portion and a front portion wherein the holder is stitched to the folded portion so as not to be visible from either the front or back of the sash tie, said sash tie having upper corners held in place by support from said fastening means so that the sash tie is held in place solely by engagement of said tie fastening means with said shirt fastening means by manual pressure on said holder, whereby only the front portion of the tie is visible on the wearer when the shirt is buttoned to the collar and the tie fastening means engages the shirt fastening means.

4,190,905
FOLDING GARMENT
Leo Reverberi, 5, passage de la Main d'Or, Paris, France (75011)
Filed Dec. 19, 1977, Ser. No. 862,132
Int. Cl.[2] A41D *15/00*
U.S. Cl. 2—1 **8 Claims**

1. A foldable garment having a body portion and a pair of sleeve portions connected to said body portions whereby said sleeve portions are connected to said body portion along an oblique seam extending from the armpit to the neck, the improvement comprising said sleeve having a plurality of longitudinally extending foldlines formed therein, and said body portion having a plurality of longitudinally extending foldlines formed therein, the foldlines of said sleeves and said body portions being disposed on opposite sides of said oblique seam, wherein said longitudinal sleeve foldlines and body foldlines define a plurality of corresponding sleeve strips and body strips respectively, whereby the respective sleeve strips and corresponding adjacent body strips which join along said oblique

seam are each substantially equal in width, said sleeve being readily foldable along said oblique seam to overlap said body portion in a folded position of said garment whereby the fold-



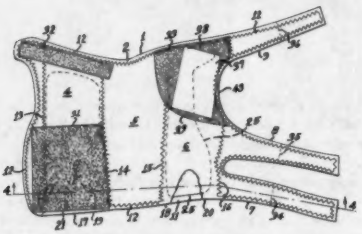
lines of said sleeves are disposed congruently to the foldlines of said body portion so that said body portion and overlying sleeves can be further jointly folded along said congruent foldlines to define a finally folded elongated panel.

4,190,906

BOWLER'S GLOVE AND WRIST SUPPORT

Edward E. Patton, Jr., 7104 Merrill Rd., Jacksonville, Fla. 32211

Filed Mar. 3, 1978, Ser. No. 883,223
Int. Cl.[2] A41D *19/00*; A63B *71/14*
U.S. Cl. 2—161 A **14 Claims**



1. In a bowling glove and wrist support, a palm plate having a first end portion and a second end portion, hand-attachable means carrying said plate for disposing said plate with its said first end portion in and bridging the palmar arch of a wearer and terminating adjacently below the palm knuckle of the middle finger and with its said second end portion across the inner surface of the wrist spanning the wrist joint, and a prop carried by said means in a position overlying said first end portion.

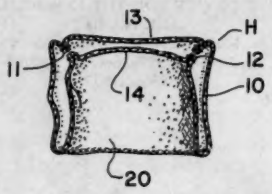
4,190,907

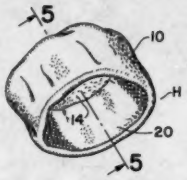
TERRY HAIR DRIER

Ann M. Cruickshank, 6978 Maplewood Rd., Parma Heights, Ohio 44130

Filed Jun. 2, 1978, Ser. No. 912,019
Int. Cl.[2] A42B *1/04*
U.S. Cl. 2—202 **4 Claims**

1. A hair dryer headpiece comprising a tubular body portion formed of an absorbent, foldable, sheet material and having end edge portions at either end; a pair of end closures made of absorbent, foldable, sheet material; said end closures having circumferential portions equal in length to said end edge portions, an end closure being sewed at said circumferential portions to said end edge portions at each said end of said body portion whereby said tubular body portion is closed at the ends; said tubular body portion being folded inwardly upon itself from either end in use thereof whereby one of said end closures is disposed within said body portion adjacent to the inside of the opposite end closure to provide a double-walled, absorbent headpiece for enveloping the head and controlling





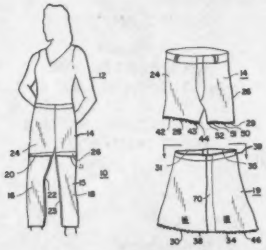
wet hair and whereby said headpiece can readily be reversed by folding said body portion inwardly from the opposite direction to turn the outer, dryer material inwardly toward the head.

4,190,908

CONVERTIBLE GARMENT

Boris A. Herskind, 6040 SW. 32nd St., Ft. Lauderdale, Fla. 33314

Filed Nov. 30, 1977, Ser. No. 855,835
Int. Cl.[2] A41D *1/14, 1/06*
U.S. Cl. 2—213 **1 Claim**



1. A convertible garment for a wearer, convertible to long patns or to short pants and a skirt, said garment comprising said short pants, a pair of long leg enclosing sections, said short pants having a pair of short leg enclosing sections, each of said long leg enclosing sections being divided along its length to form two side edges, the lower edges of said pair of said long leg enclosing sections having a combined length substantially equal to the waist size of said wearer, said pair of long leg enclosing sections having a first mode with the upper edge of one of said long leg enclosing sections secured to the lower edge of one of said short leg enclosing sections and the upper edge of the other of said long leg enclosing sections secured to the lower edge of the other of said short leg enclosing sections and said two side edges of said one long leg enclosing section

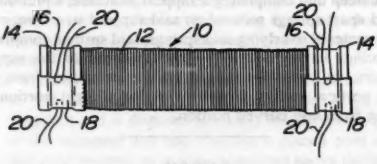
secured to each other and said two side edges of said other long leg enclosing section secured to each other to form said long patns, said pair of long leg enclosing sections having a second mode with one of said side edges of said one long leg enclosing section secured to one of said side edges of said other long leg enclosing section and the other of said side edges of said one long leg enclosing section secured to the other of said side edges of said other long leg enclosing section to form said skirt, said skirt having a waistband comprising said lower edges of said long leg enclosing sections, whereby said waistband has a size equal to the waist size of said wearer.

4,190,909

APPARATUS AND METHOD FOR SURGICAL REPAIR OF DISSECTING THORACIC ANEURYSMS AND THE LIKE

Sariel G. G. Ablaza, 1335 W. Tabor Rd., Philadelphia, Pa. 19141

Filed Mar. 31, 1978, Ser. No. 892,191
Int. Cl.² A61F *1/24, 1/00*
U.S. Cl. 3—1.4 **6 Claims**



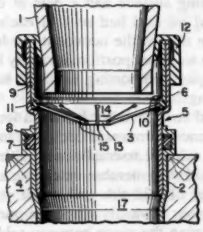
1. A prosthetic graft comprising a flexible tubular body having a rigid, non-flexible ring at each of its two opposed ends, each ring defining an opening into the tubular body, each of said rings having an annular groove on its outer periphery which is defined by an annular rib at each side thereof, a flexible cover encapsulating each of said rings, said tubular body being constructed of a woven fabric and said cover being constructed of a knitted velour fabric.

4,190,910

PLUMBING APPARATUS INCLUDING MEANS FOR PRODUCING A WATER-PLUG EFFECT IN SANITATION APPLIANCES

Lars Teglund, and Melchiorre Oldani, both of Gustavsberg, Sweden, assignors to AB Gustavsberg, Gustavsberg, Sweden

Filed Feb. 28, 1978, Ser. No. 882,180
Claims priority, application Sweden, Mar. 2, 1977, 7702341
Int. Cl.² E03D *11/02, 11/18*
U.S. Cl. 4—421 **4 Claims**



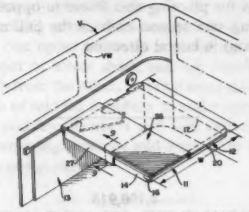
1. Plumbing apparatus for producing a water-plug effect during the flushing of sanitation appliances comprising outlet pipe means extending in a substantially vertical direction, said outlet pipe means constituting the flow outlet for such sanitation appliance, and resilient diaphragm means mounted to extend across said pipe means and structured to stem the flow of flushing water flowing therethrough until a sufficient quantity of water has accumulated, said diaphragm means upon accumulation of such sufficient quantity operating to pass said water through said pipe means thereby to cause said accumulated water to act as a water-plug, said resilient diaphragm means comprising a diaphragm formed from resilient material having formed therein a central opening with slits extending radially outwardly from said central opening of said diaphragm material, said slits operating to divide said diaphragm into a plurality of radially arranged flaps surrounding said central opening.

4,190,911

CONVERTIBLE COUCH

Craig D. Wadsworth, 107 26 Ave., Apartment 9, St. Petersburg Beach, Fla. 33706

Filed May 17, 1978, Ser. No. 906,451
Int. Cl.² B60P *3/338*
U.S. Cl. 5—44 R **16 Claims**



1. An article of furniture convertible from a seating position to a generally horizontal sleeping position, comprising: a seat portion and a backrest portion pivotally connected together; a pair of side support panels each having a plurality of support surfaces thereon engageable with opposite end portions of the seat portion and backrest portion to support the seat portion and backrest portion in the seating position and in the sleeping position, respectively, said support surfaces being of such size and shape in relation to one another and to the seat portion and backrest portion and bedding disposed in predetermined angular relationship to one another so that the seat portion and backrest portion are engaged therewith during movement between the seating position and the sleeping position and are thus balanced during their movement between a seating position and a sleeping position and very little effort is thus required, and wherein limit stops are associated with the support surfaces to engage both the seat portion and beckrest portion in the seating position and the sleeping position to limit fore and aft movement of the seat and backrest portions without requiring separate fasteners and the like.

4,190,912

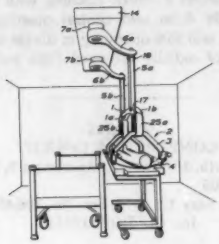
LIFTING DEVICE

Lars A. H. Nilsson, Trollbergsvägen 3 S-572 00, Oskarshamn, Sweden

Filed Jun. 12, 1978, Ser. No. 914,455
Claims priority, application Sweden, Jun. 17, 1977, 7707055
Int. Cl.² A47B *83/04;* B65G *67/12*
U.S. Cl. 5—83 **17 Claims**

1. A lifting device for lifting a load; comprising means for receiving the load, a rigid carrier arm to be placed over the load and supporting said means for receiving the load, and transfer means connected to said carrier arm for parallel movement thereof in its lateral direction, said carrier arm having two opposite ends and said transfer means including two separate but similar transfer assemblies associated with the two opposite ends respectively of the carrier arm and each including a link member having first and second opposite ends and a lever also having first and second opposite ends, said lever being pivotably supported at said first end thereof to be rotated

and being pivotably connected at said second end to said first end of said link member, and said link member being pivotably connected at said second end thereof to the associated end of



said carrier arm, and said transfer assemblies being symmetrically arranged for pivoting said levers in opposite directions, thereby causing said second ends of the link members to be lifted and moved in lateral direction.

4,190,913

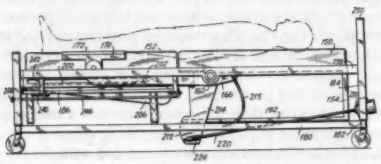
INVALID BED ARRANGEMENT

Paul L. DiMatteo, Melville, and Henry V. Diaferia, Brentwood, both of N.Y., assignors to Solid Photography Inc., Melville, N.Y.

Continuation-in-part of Ser. No. 806,777, Jun. 15, 1977, Pat. No. 4,085,471. This application Apr. 4, 1978, Ser. No. 893,467

Int. Cl.[2] A61G *7/07*

U.S. Cl. 5—81 R **11 Claims**



1. An arrangement for transferring a person from a reclined position to an upright seated position comprising: means for supporting the back side of the person with the person's posterior at a first location; means for raising the calves of the person and bending the knees of said person; means for freeing substantially the posterior of said person; means for moving the person to an upright seated position and placing said person onto a seating member so that the posterior of said person is directly in contact with said seating member; said supporting means comprising a bed member subdivided into first and second sections; means for raising said first section above said second section; means for moving said second section beneath said first section for freeing the posterior of said person; means on said first bed section abutting said seating member when said second bed section is beneath said first section for moving said seating member against the person's posterior after freeing thereof; said second bed section having means for actuating said seating member against said abutting means on said first section when said second bed section reaches its end of movement beneath said first section so that said seating member is moved upward for placement against said person's posterior; and means for actuating said means for raising the calves when raising said first bed section.

4,190,914

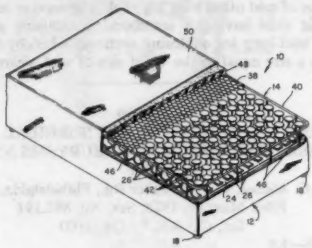
SLEEP UNIT

Souleymane Diallo, 19965 Snowden, Detroit, Mich. 48235

Filed Mar. 29, 1978, Ser. No. 891,211

Int. Cl.[2] A47C *27/08*

U.S. Cl. 5—247 **11 Claims**



1. A sleep unit comprising a support structure, a plurality of spaced apart springs secured on said support structure, cushioning material overlying said springs, said springs comprising leaf-springs having a lower portion secured to the support structure, an upwardly curved portion extending from said lower portion, and an upwardly angled straight portion extending from said curved portion.

4,190,915

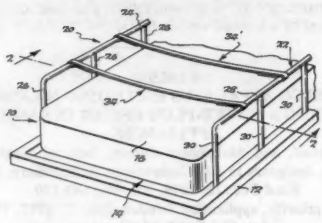
BED CLOTHING SUPPORT

Isobel J. Birt, 100 Indian Trail, Williamsville, N.Y. 14221

Filed Feb. 21, 1978, Ser. No. 879,093

Int. Cl.[2] A47C *21/00*

U.S. Cl. 5—505 **8 Claims**



1. A bed clothing support for use with a bed having an occupant supporting surface and a pair of opposite side rail assemblies located on said bed so that each rail assembly is located along one side of the occupant, each of said side rail assemblies having an upper portion normally located in a plane above said occupant supporting surface, said bed clothing support comprising:

(a) an elongated strip member having a length sufficient to span the distance across said occupant supporting surface between said side rail assemblies and with the opposite end portions of said strip member extending around the corresponding ones of said side rail upper portions and then extending further inwardly along the portion of said strip member spanning the space between said rail assemblies;

(b) said strip member being of a light weight material which is sufficiently strong to support the weight of bed clothing and which is sufficiently flexible to permit said strip member end portions to extend around and then inwardly relative to said side rail upper portions, said strip member having a surface for providing supporting contact with the bed clothing with no mechanical connection to the bed clothing; and

(c) fastening means adjacent each end of said strip member,

each of said fastening means providing a releasable connection between the corresponding portion of said strip member which extends inwardly from the corresponding side rail and the portion of said strip member which spans the distance between said side rail assemblies so as to provide a releasable connection of each of said strip member end portions to the corresponding one of said side rail upper portions, said fastening means comprising a pair of mating fastening elements adjacent each end of said strip member, one of said fastening elements of each pair being located relatively near the corresponding end of said strip member and the other mating fastening element of each pair being spaced from said one fastening element longitudinally along said strip in a direction away from the corresponding end, the distance between said mating fastening elements being sufficient to permit the portion of said strip between said fastening elements to extend around said side rail upper portions with said mating fastening elements engaging each other inwardly of said side rail, each of said fastening elements being in the form of an elongated strip, said fastening elements being engagable at selectable various locations lengthwise along the portion of said strip member where the corresponding fastening element is located to accomodate some variations in dimensions and sizes of various beds;

(d) whereby said strip member is located in spaced relation to said bed supporting surface above the body of the occupant and is disposed generally laterally with respect to the occupant and bed clothing is placed over and on said strip member so as to be supported above the body of the occupant.

4,190,916

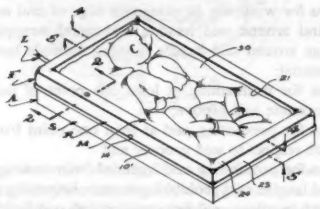
BASSINET

James P. McMullan, 2630 Seaman Ave., El Monte, Calif. 91753

Filed Oct. 25, 1978, Ser. No. 954,405

Int. Cl.[2] A47C *27/08*

U.S. Cl. 5—451 **12 Claims**



1. A water bed structure comprising a flat horizontal mattress including a bladder having vertically spaced horizontal top and bottom walls and vertical side walls of flexible water impervious sheeting and a volume of water within and filling the bladder, a flat horizontal pad of resilient reticulate material within the mattress and the water therein and positioned on the bottom wall and having a top surface normally spaced below the top wall, a retainer unit comprising a flat horizontal panel below and in supporting engagement with said bottom wall and a tubular frame about the panel with a portion projecting upwardly therefrom and cooperating therewith to define a basin in which the mattress is positioned; said frame has a vertical inside wall opposing and supporting the side walls of the mattress, said inside wall having openings communicating with the basin and the interior of the frame whereby water leaked or spilled from the mattress into the basin flows from the basin into the frame.

4,190,917

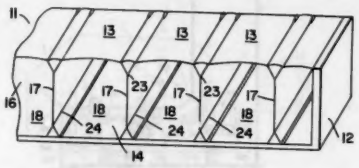
BAFFLED WATERMATTRESS CONSTRUCTION

David Calleance, 1945 - 23rd Ave., San Francisco, Calif. 94116

Filed May 9, 1978, Ser. No. 904,195

Int. Cl.[2] A47G *9/00*

U.S. Cl. 5—457 **9 Claims**



1. In a watermattress construction including upper and lower sheets joined to define a sealed, water-retaining envelope, and a plurality of baffles therein, the improvement comprising a pair of leg members having proximal ends extending from at least one upper or lower edge of each baffle to the respective upper or lower sheet, said leg members diverging angularly each from the other, and first seam means for joining the distal ends of said leg members to said respective upper or lower sheet, said leg members and said respective upper or lower sheet extending between said distal ends being disposed in triangular configuration.

4,190,918

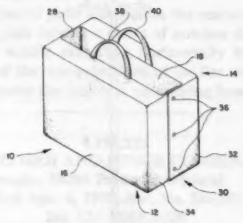
COMBINATION FOLDING CUSHION AND CARRYING ASSEMBLY

Glenn M. Harvell, 220 Baggett St., Raleigh, N.C. 27604

Filed Jul. 5, 1978, Ser. No. 921,968

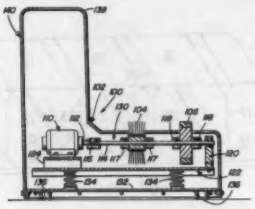
Int. Cl.[2] A47G *7/62*; A47C *27/00*

U.S. Cl. 5—465 **7 Claims**



1. A combination folding cushion and carrying assembly comprising: at least two cushions having front and back sides; an inner flexible panel interconnected between said two cushions for allowing said cushions to be folded in back-to-back spaced apart relationship; attaching means associated with said cushions and fastenable for holding said cushions in back-to-back spaced apart relationship so as to define an open area between the back sides of said cushions and said inner panel and said attaching means when fastened for accommodating carryables such as a blanket; blanket retaining means operatively associated about the back side of one cushion and operative to hold and confine a blanket about the back side thereof, said blanket retaining means including strap means supported about the back side of said cushion and extending therefrom and including fastening means for allowing said strap means to be confined and fastened about a blanket; and handle means secured to at least one cushion and extending therefrom for allowing the folded cushion and carrying assembly to be hand-carried.

4,190,919
SHOE CLEANING DEVICE
Roy T. Burford, 13715 Larkway, Sugar Land, Tex. 77478
Filed Oct. 5, 1978, Ser. No. 949,396
Int. Cl.[2] A47L *23/22*
U.S. Cl. 15—4 **8 Claims**

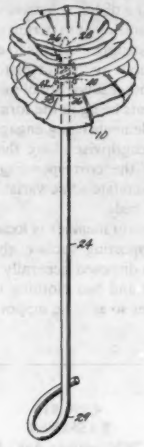


1. In a shoe cleaning device comprising: first cleaning implement means including a brush for cleaning soles of shoes which soles have a first composition; second cleaning implement means comprising an elastomeric material for cleaning soles of shoes which soles have a second composition, said first and said second cleaning implement means being attached to a common shaft; drive means for activating said first and second cleaning implements, said drive means comprising a motor attached to said shaft for causing rotation thereof; and resilient mounting means for resiliently mounting said drive means, said first cleaning implement and said second cleaning implement.

4,190,920
GARBAGE CHUTE CLEARING DEVICE
John T. Fikkers, 805 Rosita Rd., Pacifica, Calif. 94044
Filed Apr. 18, 1979, Ser. No. 31,186
Int. Cl.[2] B08B *9/02*
U.S. Cl. 15—104.05 **4 Claims**

1. A garbage chute clearing device of generally "T"-shaped configuration comprising:
a vertical member;
a horizontal member positioned upon one end of said vertical member at ninety degrees thereto and forming a "T"-shape therewith;
a plurality of sharp pointed cutting members positioned upon and protruding upwardly above said horizontal member;
a pair of hook-shaped grasping members positioned on opposite ends of said horizontal member and pointing downward in a direction opposite that of said sharp-pointed members;
a handle positioned on the end of said vertical member opposite said horizontal member;
said handle being disposed for forcing said device into said chute while imparting a combined motion of rotation and translation to said device.

4,190,921
CLEANING DEVICE
Elizabeth H. Rose, 1026 Gate Mills Towers, 6805 Mayfield Rd., Mayfield Hghts., Cleveland, Ohio 44124
Filed Nov. 9, 1978, Ser. No. 959,364
Int. Cl.[2] A47L *17/00*
U.S. Cl. 15—225 **12 Claims**

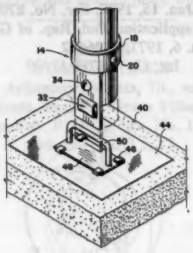


1. A mop-type device comprising:
an elongated strip of synthetic loose-weave net material of at least one thickness;
a handle having a peripheral groove near one end;
means for wrapping an elongated edge of said material in a spiral around said handle, said spiral wrapping of said edge around said handle forming multiple layers of said material;
means for maintaining at least one point of said material proximate said groove;
means for preventing said at least one point from rotating with respect to said groove; and
means for prohibiting said material from unwrapping from said handle, said prohibiting means comprising at least one stitch in at least one direction through said multiple layers, said at least one stitch maintaining the material pierced by said at least one stitch in each of said layers proximate the material pierced by said at least one stitch in the adjacent of said layers.

4,190,922
BATHTUB MOP
Pauline Elias, 202 W. 10th St., Bristow, Okla. 74010
Filed Nov. 27, 1978, Ser. No. 963,984
Int. Cl.[2] A47L *13/46*; A46B *5/02*
U.S. Cl. 15—244 A **4 Claims**

1. A bathtub-cleaning mop comprising an elongated handle, scouring pad means disposed at one end of said handle, catch means secured to said one end of the handle and having yieldable releasable clasp means having a normal closed position and being openable upon the application of sufficient pressure thereagainst, and removable bar means provided on said scour-

ing pad means and alternately engagable and disengagable with said clasp means upon the application of pressure against



the clasp for removably securing said scouring pad means to the clasp means.

4,190,923

APPLIANCES FOR CLEANING VARIOUS TYPES OF FLOORS BY SUCTION OR MOTORIZED BEATING OR BRUSHING

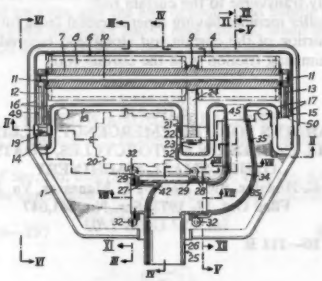
Michel A. Varin, Crepy en Valois, France, assignor to Societe Anonyme dite: Etablissements Georges Olivier, Paris, France

Filed Dec. 5, 1977, Ser. No. 857,251

Claims priority, application France, Dec. 16, 1976, 76 37947; Jul. 28, 1977, 77 23295

Int. Cl.² A47L *5/30*

U.S. Cl. 15—383 **19 Claims**



1. In an appliance for cleaning floors and carpets by a combination of suction and motorized brushing having a rotating brush for brushing and beating the floor, a brush housing containing the brush, a motor connected to the brush for rotating the brush, channel means, extending from adjacent of the brush housing to a source of suction connected to the appliance, for routing the particles dislodged from the floor by the brush and the suction to the source of suction, and connecting means, adjacent to the downstream end of the channel means, for pivotally attaching the appliance to the suction source, the improvement comprising:

a platform containing surfaces for integrally mounting the brush, the motor, and the connecting means, with a portion of the platform forming the channel means and the brush housing;

a protective cover attached to the platform and being free of contact with the brush, the motor, the channel means, and the connecting means;

and a sliding base plate attached to the platform and being free of contact with the brush, the motor, the channel means, and the connecting means.

4,190,924

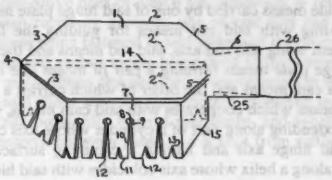
ANIMAL GROOMING DEVICE

James A. Nicholson, 10600 Van Stralen Way, Rancho Cordova, Calif. 95670

Filed Oct. 11, 1977, Ser. No. 841,061

Int. Cl.² A47L *9/06*

U.S. Cl. 15—402 **1 Claim**



1. An improvement in a grooming brush comprising a main section including a flat top portion formed with parallel sides, forward extensions of the sides extending diagonally inwardly toward each other and meeting to form a forward apex, rearward extensions of the sides extending diagonally inwardly toward each other but having spaced ends, all sides and extensions thus forming a generally hexagonally-shaped top portion,

a rigid skirt extending vertically downward from the sides and extensions of the top portion, the sides and forward extensions of the skirt being provided with a plurality of horizontally-disposed, spaced circular apertures, each aperture having a narrow opening ar its lower end leading into a triangular slot which extends to the base of the skirt,

a plurality of triangular notches disposed between said triangular slots at the base of the skirt,

a longitudinal center strip attached to and extending vertically downwardly from the flat top portion dividing said brush into twin chambers, said strip being provided with spaced apertures, open-ended triangular slots, and open-end triangular notches,

a triangular shaped plate attached to the rearward end of the skirt, said plate having a series of notches therein, and

a cylindrical nozzle extending horizontally from the rearward end of the rear extensions of the flat top portion and skirt to receive the end of a vacuuming hose.

4,190,925

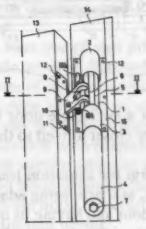
DOOR-CLOSER AND HINGE COMBINATION

Mauno K. Koivusalo, 20200 Turku 20, Finland

Filed Apr. 4, 1978, Ser. No. 894,081

Int. Cl.² E05F *3/20*

U.S. Cl. 16—54 **15 Claims**



1. In a door-closer and hinge combination, a pair of hinge plate means respectively adapted to be fixed to a door and door frame, said pair of hinge plate means respectively fixedly carrying a pair of extension means which respectively extend from said pair of hinge plate means and which are situated along a predetermined hinge axis, said pair of extension means respec-

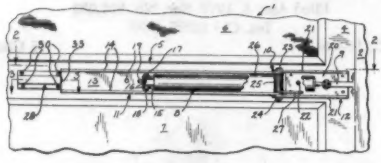
tively being formed with coaxial bores having a common axis coinciding with said hinge axis, and a hinge pin situated in said coaxial bores so that through said pair of extension means said pair of hinge plate means are hingedly connected to each other to provide for turning of the hinge plate means connected to the door about said hinge axis with respect to the hinge plate means connected to the door frame, elongated force-transmitting rod means having a rod axis which is parallel to said hinge axis, guide means carried by one of said hinge plate means and cooperating with said rod means for guiding the latter for movement along said rod axis, said rod means and the other of said hinge plate means forming a pair of means one of which carries a cam means and the other of which carries a cam-follower means which cooperates with said cam means, said cam means extending along part of a cylinder whose axis coincides with said hinge axis and having a camming surface which extends along a helix whose axis coincides with said hinge axis, so that during turning of the hinge plate means connected to the door with respect to the hinge plate means connected to the door frame, about said hinge axis, said cam means and cam-follower means cooperate for displacing said rod means along said rod axis thereof in a door-opening direction during opening of a door and in an opposite axial direction along said rod axis in a door-closing direction during closing of a door, and force means operatively connected with said rod means for storing a force when said rod means moves in said door-opening direction and for delivering the stored force through said rod means and said cam means and cam-follower means to the hinge plate means which is connected to the door for providing a door-closing force when said force means acts on said rod means to displace the latter in said door-closing direction, so that when a door is opened a force for closing the door is stored at said force means and when the door is to be closed said stored force will be utilized for closing the door.

4,190,926

DOOR GUARD

John Cronin, 8510 W. Layton Ave., Greenfield, Wis. 53228

Filed Feb. 27, 1979, Ser. No. 15,710
Int. Cl.² E05F *3/00*
U.S. Cl. 16—65 **10 Claims**



1. A door guard for a swingable door that is mounted in a doorway having a door closer affixed to the doorway comprising:

a flexible resilient arm for extension transversely across the inside of the door, said arm being adapted to be anchored at one end to the door and having its other end adapted for relative movement with respect to the door; and

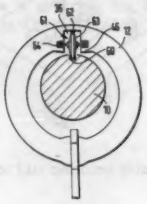
connection means for pivotally connecting the arm to the door closer at a point intermediate the ends of said arm so that when the door opens to its normally widest open position the arm flexes to permit the door to continue opening and slows the rate of movement of the door to prevent damage to the door, door closer and doorway.

4,190,927

CURTAIN ROD TRACK FITTING

Erwin Hepperle, Hamletstr. 4, 7000 Stuttgart 80, Fed. Rep. of Germany

Filed Jan. 16, 1978, Ser. No. 870,036
Claims priority, application Fed. Rep. of Germany, Jan. 11, 1977, 2700838; Jun. 6, 1977, 2726492
Int. Cl.² A47H *15/00*
U.S. Cl. 16—96 D **7 Claims**



1. A curtain rod track fitting for slidably supporting a curtain or the like on a curtain rod comprising:

a closed ring member for completely encircling the curtain rod,

said ring member having a recess formed in an inner portion thereof and opening toward the center of said ring member for mounting a roller member therein,

said recess having a deep portion providing clearance for said roller member and a pair of notches for mounting an axle of said roller member such that said roller member is free to roll along the curtain rod and said axle is substantially transverse to the curtain rod,

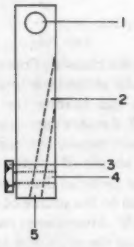
said roller member having tapered radial faces for engaging a portion of the curtain rod along said tapered faces for minimizing friction with the curtain rod.

4,190,928

APPARATUS FOR THE EMERGENCY PULLING OF SMALL CABLES ON MOTORCYCLES, BOATS AND OTHER SMALL MACHINERY

William C. Hudgins, 9756 Beech Pl., Manassas, Va. 22110

Filed Oct. 11, 1977, Ser. No. 841,047
Int. Cl.² G05G *1/02*
U.S. Cl. 16—111 R **1 Claim**



1. An emergency tool for the hand pulling of cables on motorcycles, boats and other small machinery comprising

a body including an elongate shank having a first end and a second end and a handle extending transversely to said shank at said first end;

an internally threaded hole disposed in said shank at said second end having an axis extending perpendicular to the longitudinal axis of said shank;

a set bolt threadedly engaging said hole; and

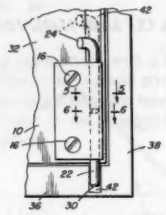
a through bore extending through a portion of said shank

and communicating with said hole, said bore being arranged at an acute angle to the longitudinal axis of said shank to extend from said second end to a lateral side wall of said shank whereby any length of cable can be passed through said bore and held in place by said set bolt.

4,190,929
PLASTIC HINGE

James J. Palka, Arlington Heights, Ill., assignor to General Bathroom Products, Inc., Elk Grove Village, Ill.

Filed Feb. 16, 1979, Ser. No. 12,863
Int. Cl.[2] E05D 5/12
U.S. Cl. 16—169 2 Claims

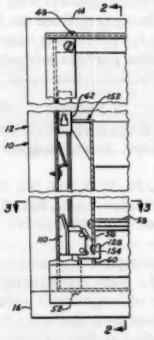


1. An all-plastic hinge for a door in a cabinet having a perforation adjacent the front upper and lower front frames, comprising a single plate secured to the rear of the door and a single split knuckle, a boss positioned medially of the ends of said knuckle and extending inwardly of the inner surface of said knuckle and around the inner surface thereof, a pin, an integral handle on one end of said pin extending at right angles to said pin, an annular groove in said pin cooperating with said boss in said knuckle, and the end opposite said handle extending well beyond the upper end of said knuckle when in operative position and in the perforation of the cabinet.

4,190,930
WINDOW AND SASH BALANCE

Dwight M. Prosser, 673 S. Lex-Springmill Rd., Mansfield, Ohio 44906

Division of Ser. No. 624,757, Oct. 23, 1975, Pat. No. 4,078,336.
This application Feb. 17, 1978, Ser. No. 878,738
Int. Cl.[2] E05D 17/00
U.S. Cl. 16—197 8 Claims

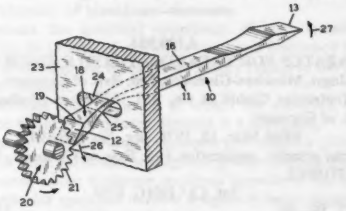


1. A window comprising: a frame having opposing jambs with vertical sash receiving grooves which face each other, a sash having channel shaped stiles with outwardly extending legs received in said opposing vertical grooves, a pair of elongated balance housings of generally uniform cross section with respective ones being positioned in respective ones of said opposing vertical grooves, an extensible member projecting outwardly of each housing, retraction spring means in each housing for retracting said extensible members, first anchor means on each of said extensible members, second anchor means on each of said balance housings, a pair of sash guides for spacing the upper opposite sides of said sash from said balance housings, a pair of sash hooks respective ones of which are hooked to the respective bottom corner of said sash, a pair of slides respective ones of which are positioned in respective vertical sash receiving grooves, one of said first and second anchor means being fastened to said slides and the other of said first and second anchor means being fixed to the jambs of said window, and inclined slot and pin means connecting said sash hooks to said slides with the slots thereof extending upwardly and laterally ourwardly toward said jambs, and whereby the sash is centered between jambs and is kept from rattling.

4,190,931
BRAKE ADJUSTING SPOON

Cosmo Del Bianco, 1631 E. 37th St., Brooklyn, N.Y. 11234

Filed Jan. 3, 1978, Ser. No. 866,503
Int. Cl.[2] B25B 13/48
U.S. Cl. 81—3 R 3 Claims



1. A tool for adjusting a rotatable means in a drum brake structure or the like, which comprises

(a) a longitudinally elongated, three-dimensional body having a predetermined width dimension,

(b) a relatively thin blade-like working end integral with at least one end of said body,

(c) said body including principal top and bottom surfaces generally spaced from one another said predetermined width and angled toward one another from an area of the body adjacent the working end to the thin blade-like working end, and

(d) a portion of at least one of said principal surfaces being formed to include an area disposed at an incline to the remaining portions of said one principal surface,

(e) said inclined portion forming an angle to the remaining portions of said one principal surface, which angle is at a slant reversely beveled with respect to the angled area of said one principal surface adjacent the working end,

(f) said working end being arranged for insertion through an opening in said drum brake structure for engagement with said rotatable adjusting means,

(g) said inclined portion of said one principal surface being arranged and configured whereby the inclined portion engages the drum brake structure adjacent said opening when the working end is in engagement with said rotatable means, thereby urging the working end further into engagement.

4,190,932

METHOD AND APPARATUS FOR OPENING TEXTILE FIBER BALES

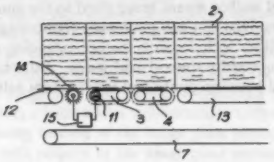
Hans Trützchler, Monchen-Gladbach, Fed. Rep. of Germany, assignor to Trützchler GmbH & Co. KG., Menchen-Gladbach, Fed. Rep. of Germany

Filed Jun. 16, 1978, Ser. No. 916,370

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1977, 2731811

Int. Cl.[2] D01G 7/04

U.S. Cl. 19—81 10 Claims



7. Apparatus for opening textile fiber bales, comprising at least two needle tables for breaking up a row of textile fiber bales, said needle tables being placed small distances apart in a row from a bottom side of the fiber bales; said needle tables having needle points with distances between needle tables being continuously variable; means for changing said distance automatically depending on predetermined properties inherent to said bales during operation of said needle tables; means for weighing an amount of detached fiber; and control means connected to said weighing means for changing said distance between needle tables as a function of weight of detached fiber.

4,190,933

APPARATUS FOR BREAKING TEXTILE FIBER BALES

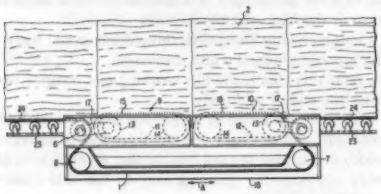
Peter Jagst, Mönchen-Gladbach, Fed. Rep. of Germany, assignor to Trutzchler GmbH & Co. KG., Mönchen-Gladbach, Fed. Rep. of Germany

Filed Mar. 13, 1978, Ser. No. 885,895

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1977, 2710962

Int. Cl.[2] D01G 7/04

U.S. Cl. 19—81 15 Claims



1. In an apparatus for breaking textile fiber bales, including a plurality of spiked breaker members; rotating means for rotating each breaker member in a working direction generally parallel to a length dimension of the apparatus; the breaker members being spaced from one another parallel to the working direction; support means for receiving a series of bales juxtapositioned parallel to the working direction for exposing the underside of the bales to the breaker members; the improvement comprising

(a) a flexible underlay extending parallel to the working direction for engaging face-to-face the underside of the bales; said flexible underlay forming at least one part of said support means and being immobilized for substantially preventing displacement of said flexible underlay as a whole parallel to the working direction;

(b) means forming an upwardly open chamber of one part of said flexible underlay; said breaker members being accommodated in said chamber for engaging the underside of the bales situated at least in part within the outline of the chamber opening; and

(c) displacing means for moving said chamber and said breaker members as a unit parallel to the working direction.

4,190,934

SEPARABLE BUCKLE

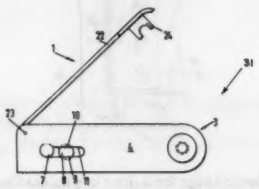
Leo J. Wildi, Radlett, England, assignor to Securiweb Limited, Bedfordshire, England

Filed Jun. 2, 1978, Ser. No. 912,100

Claims priority, application United Kingdom, Jun. 2, 1977, 23400/77

Int. Cl.[2] A44B 11/25, 13/00

U.S. Cl. 24—77 R 8 Claims



1. A buckling assembly for a safety belt or safety harness, comprising:

first and second interconnectable parts;

a transverse bar on said first part;

a hook on said second part for engaging around said bar;

locating means for locating said second part relative to said first part;

a larger diameter portion and a smaller diameter portion on the transverse bar;

said hook having an opening of a width larger than the smaller diameter portion of the bar but smaller than the larger diameter portion of the bar, and a centre having a width larger than said large diameter portion;

the larger and smaller diameter portions being movable longitudinally of the bar and relative to the locating means between a first position where the smaller diameter portion registers with the hook so that the hook can be received around the bar, and a second position where the larger diameter portion registers with the hook so that the hook cannot be disengaged from the bar; and

immobilising means for preventing movement of the larger and smaller diameter portions into said first position.

4,190,935

SLIDE FASTENER STRINGER

Yoshio Matsuda, Nyuzen, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Jan. 30, 1978, Ser. No. 873,489

Claims priority, application Japan, Feb. 8, 1977, 52/14115[U]

Int. Cl.[2] A44B 19/00

U.S. Cl. 24—205.16 C 8 Claims

1. A slide fastener stringer comprising:

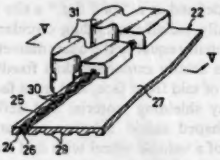
(a) a stringer tape of a warp-knit structure having on its one surface a plurality of longitudinal wales and a plurality of longitudinal grooves each extending between every adjacent wales, the other surface of said stringer tape being relatively flat;

(b) a single reinforcing cord disposed at one of said grooves which is located adjacent to one longitudinal edge of said stringer tape, said reinforcing cord extending longitudinally in said groove;

(c) sewing stitches extending across and through said rein-

forcing cord and stringer tape at spaced intervals along said stringer tape, said sewing stitches having portions which form protuberances on said other surface; and

(d) a series of discrete fastener elements mounted on and spaced along said one longitudinal edge of the stringer



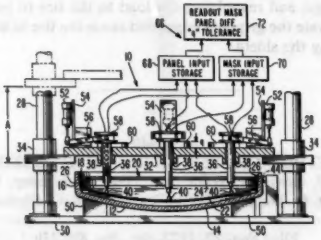
tape in clamping engagement with said reinforcing cord and sewing stitches including said portions over said one longitudinal edge of the stringer tape, said fastener elements being secured to the stringer tape solely by said clamping engagement.

4,190,936

APPARATUS AND METHOD FOR DETERMINING DEVIATION OF MASK-TO-FACEPLATE SPACING IN A CATHODE-RAY TUBE

Marinus Van Renssen, Leola, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 23, 1978, Ser. No. 953,938
Int. Cl.² H01J *9/18*
U.S. Cl. 29—25.15 **7 Claims**



1. A method for determining the deviation in shadow mask-to-faceplate spacing from a desired spacing during cathode-ray tube construction comprising the steps of,

sensing the position of the interior surface of a faceplate without a shadow mask being mounted adjacent said faceplate,

mounting a shadow mask adjacent said faceplate, and

sensing the position of a side of said shadow mask opposite said faceplate,

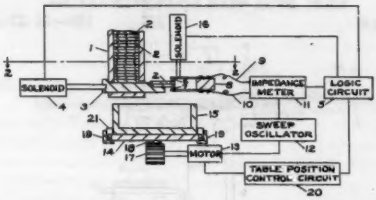
determining the difference in the two sensed positions minus the shadow mask thickness which is the deviation in the mask-to-faceplate spacing, and accepting or rejecting the assembly based on whether the deviation is within desired limits.

4,190,937

METHOD OF MANUFACTURING ELECTROACOUSTIC TRANSDUCER ELEMENTS WHICH OPERATE IN THE VICINITY OF RESONANCE

Frank Massa, Cohasset, Mass., assignor to The Stoneleigh Trust, Fred M. Dellorfano, Jr. & Donald P. Massa, Trustees, Cohasset, Mass.

Filed Jan. 2, 1979, Ser. No. 135
Int. Cl.² H04R *31/00*
U.S. Cl. 29—25.35 **14 Claims**



1. A method for manufacturing electroacoustic transducers which incorporate in their design vibratile transducer elements which are required to operate within a specified frequency band in the vicinity of the resonant frequency region of said elements, including the following steps:

(a) adjust at least one of the resonant frequency controlling dimensions of a plurality of transducer elements to a uniform specified value which is greater than the dimension necessary to achieve the specified resonant frequency for said plurality of transducer elements,

(b) measure the motional impedance of each transducer element as a function of frequency over a frequency range which includes the resonant frequency region of the transducer element,

(c) determine the frequency at which the motional impedance of each transducer element is a minimum,

(d) segregate the transducer elements into separate groups in which each particular segregated group contains selected elements whose minimum motional impedance lies within a particular specified narrow frequency band assigned to the particular segregated group,

(e) reduce the resonant frequency controlling dimension of the transducer elements within each particular segregated group by a prescribed specified amount to cause the frequency at which the minimum motional impedance occurs to change by the required amount needed to make the resonance frequency characteristics of all elements contained within each segregated group fall within the same specified operating frequency band.

4,190,938

MACHINE WITH PROCESSING HEADS

Hans Hillmann, Hirschgraben 19, D 6603 Sulzbach, Saar, Fed. Rep. of Germany

Division of Ser. No. 776,429, Mar. 10, 1977, Pat. No. 4,109,360.
This application Jun. 22, 1978, Ser. No. 917,882
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1976, 2610185
The portion of the term of this patent subsequent to Aug. 29, 1995, has been disclaimed.
Int. Cl.² B23B *39/20*; B23Q *3/157*
U.S. Cl. 29—26 A **1 Claim**

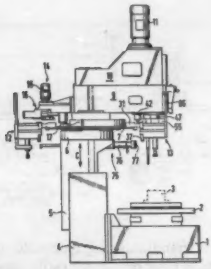
1. In a machine of the type having a base structure, a carrier rotatably mounted on said base structure, a plurality of processing heads each having a rotatable spindle mounted thereon, means for releasably mounting said heads on and with said carrier at locations such that the spindles are substantially equally spaced apart, carrier drive means mounted on said base structure and engaging said carrier to rotatably drive said

carrier, spindle drive means mounted on said base structure and angularly separated from said carrier drive means, the carrier drive means including means for securing said carrier in a preselected rotational position in which

a selected one of said processing heads is located adjacent said spindle drive means such that said spindle drive means can be coupled to a spindle therein by a releasable coupling, the improvement wherein said carrier drive means comprises

a rotatable shaft;

a crank mounted on said shaft for rotation therewith;



a slide member mounted in the plane of said crank, said slide member having means defining a recess shaped to receive said crank in either one of only two rotational positions of said crank, said two positions being separated by 180° of crank rotation;

means for supporting said slide member for sliding movement toward and away from said shaft in a plane lying at an angle to the axis of said shaft; and

means for moving said slide member into receiving engagement with said crank in said one of said positions to thereby fix said crank and said carrier drive means in the preselected rotational position.

4,190,939

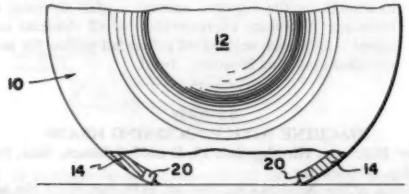
VEHICLE TIRE SUN SHIELD AND METHOD OF INSTALLING SAME

Ervin J. Keller, 15 Long Point Rd., Germfask, Mich. 49836

Filed Sep. 14, 1978, Ser. No. 942,434

Int. Cl.[2] B23P *11/02;* **B65D** *85/04, 85/06;* **B62B** *9/16*

U.S. Cl. 29—451 **4 Claims**



1. A tire sun shield for use upon a load supporting wheel of a parked vehicle comprising a generally radially extending circular front face of a diameter substantially equal to the outer diameter of a tire to be shielded, an axially extending skirt fixedly joined to the outer periphery of said front face, said front face and said skirt being of opaque material and defining a shallow generally cup-shaped shield member conformed to snugly receive the tire of a vehicle wheel with said front face overlying the outer side portions of the tire and said skirt overlying at least the axially outer portion of the tire tread, said shield member having an opening therein through said skirt and the lower portion of said front face wherein the edges of said opening are defined by a horizontal edge extending along a chord of the circular front face and opposed gripping edges extending generally axially entirely across said skirt from the opposite ends of said horizontal edge, the distance between the opposed gripping edges being slightly less than the length of the normal "load flat" of the tire.

3. In combination with a normally inflated, load bearing, resilient vehicle tire having a deformed flattened ground engaging portion defined as a "load flat;" a tire sun shield comprising a generally radially extending circular front face of a diameter substantially equal to the outer diameter of a tire to be shielded with an axially extending skirt fixedly joined to the outer periphery of said front face, said front face and said skirt being of sun ray shielding material and defining a shallow generally cup-shaped shield member conformed to snugly receive the tire of a vehicle wheel with said front face overlying the outer side portions of the tire and said skirt overlying at least the axially outer portion of the tire tread, said shield member having an opening therein through said skirt and the lower portion of said front face wherein the edges of said opening are defined by an edge extending generally along a chord of the circular front face and opposed gripping edges extending generally axially across said skirt from the opposite ends of said horizontal edge, the distance between the opposed gripping edges being slightly less than the length of the "load flat" of the tire and the gripping edges of the skirt being incrementally forced apart so that the shield is stressed and the tire is tightly gripped by the shield.

4. A method of installing a tire sun shield upon the load-supporting inflatable, resilient tire on the wheel of a parked vehicle, which tire is flattened at its lower end by the load it bears, comprising: removing the load from the wheel so that it returns to its cylindrical non-loaded state; placing a sun shield having a generally radially extending circular front face of a diameter substantially equal to the outer diameter of the tire to be shielded with an axially extending skirt joined to the outer periphery of said front face over the front face of the wheel, in shielding relationship with the tire, said shield member having an opening of predetermined extent less than the "load flat" of the tire therein through said skirt and the lower portion of said front face wherein the edges of said opening are defined by a horizontal edge extending along a chord of the circular front face and opposed gripping edges extending generally axially entirely across said skirt from the opposite ends of said horizontal edge; and reapplying the load to the tire to incrementally separate the gripping edges and cause the tire to be tightly gripped by the shield.

4,190,940

METHOD OF ASSEMBLING AN ACTUATOR

Anthony J. Lawrence, Teddington, Near Tewkesbury, England, assignor to Tungum Hydraulics Limited, Cheltenham, England

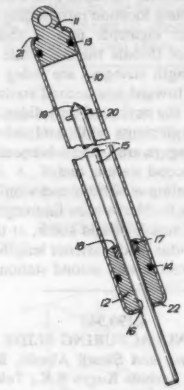
Filed Sep. 27, 1977, Ser. No. 837,210

Int. Cl.[2] B23P *15/00*

U.S. Cl. 29—156.4 R **3 Claims**

1. A method of assembling an actuator having a pressure cylinder comprising a tube, two end closure elements each secured to a respective end of the tube, a body of flowable material contained within the tube between the end closure elements, and a piston extending through a through-bore in one of the end closure elements and projecting into the body of flowable material, said method including the steps of securing to one end of the tube the end closure element through which the piston extends, fully extending the piston, inserting heated flowable material into the tube with the open end thereof uppermost, cooling the flowable material to a first temperature at which it hardens, inserting the other end closure element into the open upper end of the tube, securing said other end

closure element to the tube, and heating the body of flowable material to a second higher temperature whereby it expands



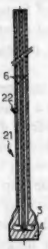
and forces the end closure elements outwards from the positions in which they were initially secured.

4,190,941

METHOD OF MAKING COOLED VALVES FOR INTERNAL COMBUSTION ENGINES AND VALVES OBTAINED THEREBY

Francis Charron, Croissy-sur-Seine, France, assignor to Basset Bretogne Loire-B.B.L., Sevres, France

Filed May 19, 1978, Ser. No. 907,699
Claims priority, application France, May 27, 1977, 77 16384
Int. Cl.² B21C *23/22*
U.S. Cl. 29—156.7 C **6 Claims**



1. A method of making unitary cooled valves such as for internal combustion engines, comprising the steps of:

providing a first substantially cylindrical billet formed of an extrudable material and drilling an axial blind bore in said billet to form a valve blank therefrom;

machining an inner circumferential groove at the blind end portion of said bore;

providing a second substantially cylindrical billet formed of an extrudable material, forming a cylindrical rod-shaped core from said second billet with a diameter complementary of that of said blind bore and forming at least two longitudinally extending flow channels in said core, said channels opening at their opposite ends;

inserting said core into the bore at said valve blank with said channels opening into said groove to form an assembly;

filling said channels and said groove with a substance having a relatively low melting point, said substance being in its melted state;

allowing said substance to solidify;

extruding after solidification of said filling substance said assembly so as to form a valve having a desired size and at the same time provide a good cohesion between the first billet and the core;

heating said valve so as to cause the filling substance to melt and to be removed from the channel and groove; and

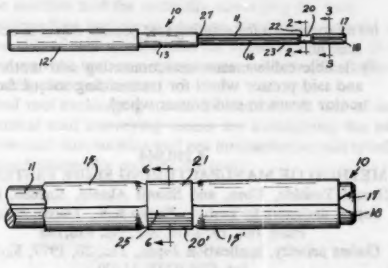
shaping the valve to form a valve head.

4,190,942

APPARATUS AND METHOD FOR WINDING AND INSERTING SHEET MATERIAL INTO A TUBE

Percy A. Tucker, P.O. Box 34357, Richmond, Va. 23234

Filed Jul. 10, 1978, Ser. No. 923,514
Int. Cl.² B31C *13/00*; B23P *15/00, 19/04*
U.S. Cl. 29—451 **5 Claims**



1. An apparatus for winding a relatively wide first sheet of material into a tube and winding a relatively narrow second sheet of material onto said tube in a fixed position intermediate the ends thereof, comprising an elongated mandrel, a generally cylindrical portion extending axially from one end of said mandrel, channel means extending along said cylindrical portion generally parallel with the axis thereof for receiving one edge of said first sheet, stop means on said mandrel in a position to stop said first sheet, at least one annular recess located intermediate said end of said cylindrical portion and said stop means, said recess having first and second annular walls in spaced and non contacting relationship with one another, said recess being at least as wide as said second sheet of material, and means for rotating said mandrel, whereby said first sheet may be inserted into said channel means in abutting relationship with said stop means so that rotation of said mandrel winds said first sheet into a tube located in a predetermined position on said cylindrical portion and thereafter said second sheet is aligned with said annular recess and wound onto said first sheet in a predetermined location relative to at least one end of the tube.

4,190,943

GASKET INSTALLING DEVICE

Kihei Takahashi, Uozu, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Apr. 25, 1978, Ser. No. 899,868
Claims priority, application Japan, May 4, 1977, 52/56890[U]
Int. Cl.² B23P *19/02*
U.S. Cl. 29—235 **6 Claims**

1. A device for installing an elongate gasket continuously along and surrounding an edge of a panel, comprising:

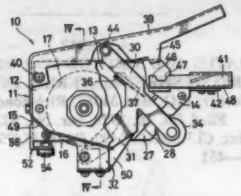
(a) a hollow frame;

(b) a circumferentially grooved guide roller rotatably mounted on said frame for rolling engagement in its groove with the panel edge for guiding said frame to move therealong;

(c) a circumferentially grooved presser wheel rotatably disposed in said hollow frame, said wheel having means in its groove for engaging and pressing the elongate gasket

against the panel edge whereby the gasket becomes fully installed on the panel edge;

(d) a gasket guide disposed in said hollow frame and having a passage extending at an angle to an edge of said frame, said passage having a discharge opening adjacent to said presser wheel and to said frame edge;



(e) motor means for rotating said presser wheel in one direction; and

(f) flexible cable means interconnecting said motor means and said presser wheel for transmitting torque from said motor means to said presser wheel.

4,190,944

METHOD OF MANUFACTURING SLIDE FASTENERS

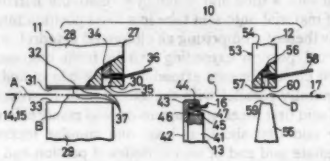
Hiroshi Yoshida, Uozu, and Shunji Akashi, Kurobe, both of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Jun. 19, 1978, Ser. No. 916,735

Claims priority, application Japan, Jun. 30, 1977, 52/78277

Int. Cl.[2] B23P *11/00*

U.S. Cl. 29—408 **2 Claims**



1. A method of manufacturing individual slide fasteners from a pair of continuous slide fastener stringers having a pair of stringer tapes including thermoplastic synthetic fibers and a pair of interengaged rows of fastener elements made of thermoplastic synthetic resin and mounted on and along the confronting edges, respectively, of the stringer tapes, comprising the steps of:

(a) feeding said fastener stringers intermittently for a distance corresponding to a desired fastener length;

(b) producing an element-free gap in said fastener stringers at a first station by cutting with ultrasonic processing means while said stringers are at rest between intermittent movements;

(c) simultaneously with the gap producing step, cutting off said element-free gap at said first station with said ultrasonic processing means, thereby providing an individual slide fastener length;

(d) simultaneously with the gap producing step and the stringers cutting step, fusing the edges of the element-free gap and the cut ends of the fastener stringers and of the slide fastener length at said first station with said ultrasonic processing means;

(e) simultaneously with the gap producing step, forming a top end stop on the cut end portion of said individual slide fastener length at said first station with said ultrasonic processing means;

(f) thereafter, at an intermediate location between said first station and a second station, separating the fastener stringers of said individual slide fastener length apart from each other along a limited length portion of said stringers so as to disengage the rows of fastener elements at said intermediate location to permit the introduction of said disengaged rows of fastener elements into a slider;

(g) at said intermediate location introducing said disengaged rows of fastener elements into a slider respectively through a pair of throats thereof while said individual slide fastener length stringers are being advanced from said first station toward said second station;

(h) reengaging, by the action of said slider, the disengaged rows of fastener elements while said individual slide fastener length stringers are being advanced from said first station to said second station; and

(i) thereafter, mounting a bottom end stop on the rows of fastener elements that have been interengaged again after issuing from the mouth of said slider, at the cut end portion of said individual slide fastener length stringers while the latter are at rest at said second station.

4,190,945

METHOD OF MANUFACTURING SLIDE FASTENERS

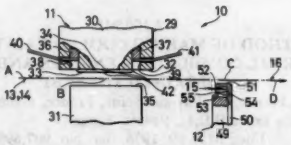
Hiroshi Yoshida, Uozu, and Shunji Akashi, Kurobe, both of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Jun. 19, 1978, Ser. No. 916,597

Claims priority, application Japan, Jun. 30, 1977, 52/78278

Int. Cl.[2] B23P *11/00*

U.S. Cl. 29—408 **1 Claim**



1. A method of manufacturing individual slide fasteners from a pair of continuous slide fastener stringers having a pair of stringer tapes including thermoplastic synthetic fibers and a pair of interengaged rows of fastener elements made of thermoplastic synthetic resin and mounted on and along the confronting edges, respectively, of said stringer tapes, comprising the steps of:

(a) feeding said fastener stringers intermittently for a distance corresponding to a desired fastener length;

(b) producing an element-free gap in said fastener stringers by cutting with ultrasonic processing means while said stringers are at rest between intermittent movements;

(c) simultaneously with the gap producing step, cutting off said fastener stringers across said element-free gap with said ultrasonic processing means, thereby providing an individual slide fastener length and defining the top end boundary of one individual slide fastener and the bottom end boundary of the sequentially adjacent individual slide fastener;

(d) simultaneously with the gap producing step and the stringers cutting step, fusing the edges of the element-free gap and the cut ends of the fastener stringers and of the slide fastener length with said ultrasonic processing means;

(e) simultaneously with the gap producing step, forming with said ultrasonic processing means a pair of separated resilient top end stops on respective cut end portions of said fastener stringers associated with said one individual slide fastener, said top end stops each being formed with a configuration that permits each top end stop to pass through a slider upon flexure of said top end stop, and at the same time forming with said ultrasonic processing means a bottom end stop on the cut end portion of said sequentially adjacent individual slide fastener; and

(f) introducing said interengaged rows of fastener elements on said fastener stringers of said one individual slide fas-

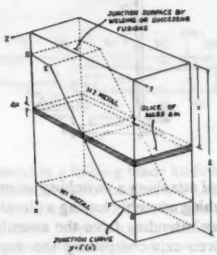
tener into a slider through a mouth thereof with portions of each top end stop being forcibly and resiliently flexed away from each other by the body of said slider while said stringers are being advanced, thereby allowing said top end stops to move past said slider.

4,190,946

PROCESS FOR FABRICATION OF A CONSUMABLE METALLIC ELECTRODE

Jose D. De Souza, Sao Paulo, Brazil, assignor to Electrometal Acos Finos S. A., Brazil

Filed Nov. 4, 1977, Ser. No. 848,588
Claims priority, application Brazil, Apr. 22, 1977, 02533
Int. Cl.[2] B22D *11/126*
U.S. Cl. 29—527.7 **7 Claims**



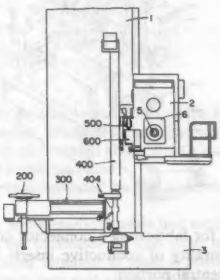
1. A process for the manufacture of a metal ingot having a chemical composition varying continuously along its axis, comprising the steps of: fabricating a metallic electrode by joining at least one pair of metallic segments of different chemical composition along a junction surface which follows a curve defined by an arbitrarily chosen equation, said segments having respective predetermined masses and dimensions, and remelting said electrode by the electroslag process to form an ingot having a chemical composition varying continuously along its axis, the concentration of each chemical element varying along an axis according to an equation defined by the manner in which the electrode is fabricated.

4,190,947

AUTOMATIC TOOL EXCHANGING APPARATUS OF MACHINE TOOL

Mituharu Sato, and Katsuo Yamazaki, both of Numazu, Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 24, 1978, Ser. No. 954,308
Claims priority, application Japan, Nov. 4, 1977, 52-132222
Int. Cl.[2] B23Q *3/157*
U.S. Cl. 29—568 **7 Claims**



1. An automatic tool exchanging apparatus of a machine tool having a base, a column mounted on said base, a spindle head located on one of said column and movable therealong and a spindle supported by said spindle head to be movable in the axial direction comprising:

a tool storing magazine mounted on said base and provided with a number of tool holders in which tools are vertically supported with their shanks downwardly directed;

first tool exchanging means located in front of a selected tool exchanging holder of said tool storing magazine when tools are to be exchanged;

horizontal tool conveying means connected to said first tool exchanging means and extending horizontally with respect to said magazine for horizontally conveying a tool with its shank downwardly directed;

vertical tool conveying means connected to said horizontal tool conveying means and extending along said column of the machine tool for vertically conveying the tool;

an intermediate tool pot mechanism pivotably supported on one side of said spindle head for receiving the tool from said vertical tool conveying means with its shank downwardly directed; and

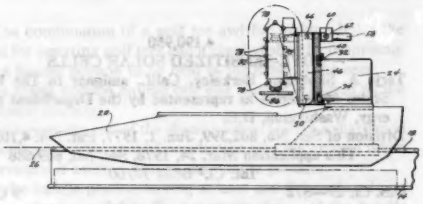
second tool exchanging means located on one side of said vertical tool conveying means for transferring the tool from said intermediate tool pot mechanism to said spindle after horizontally rotating the tool.

4,190,948

VERTICAL SPINDLE MACHINE TOOL WITH TILTABLE SPINDLE AND TILTABLE AUTOMATIC TOOL CHANGER

Ervin J. Kielma, West Allis, Wis., assignor to Kearney & Trecker Corporation, West Allis, Wis.

Filed Dec. 6, 1978, Ser. No. 966,906
Int. Cl.[2] B23Q *3/157*
U.S. Cl. 29—568 **3 Claims**



1. A vertical spindle machine tool comprising:

a frame;

a spindle base pivotally mounted on said frame for rocking movement about a horizontal axis;

a spindle head slidably mounted on said spindle base for linear movement along a substantially vertical axis which tilts in response to rocking movement of said base about said horizontal axis;

a spindle rotatably mounted on said spindle head for rotation about said substantially vertical axis, said spindle being adapted to receive a toolholder and to clamp said toolholder therein;

a tool storage magazine mounted on said spindle base, said tool storage magazine being adapted to receive and to store a plurality of toolholders, and said tool storage magazine being tiltable along with said spindle to enable toolholders to be transferred between said tool storage magazine and said spindle at any spindle tilt angle; and

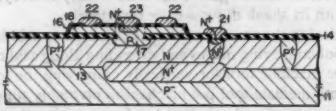
transfer means mounted for tiltable movement with said base and said magazine for transferring toolholders between said spindle and said tool storage magazine.

4,190,949

METHOD FOR MANUFACTURING A SEMICONDUCTOR DEVICE

Masashi Ikeda, and Kazuo Kihara, both of Tokyo, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 14, 1978, Ser. No. 960,644
Claims priority, application Japan, Nov. 14, 1977, 52/135752; Nov. 14, 1977, 52/135753; Nov. 14, 1977, 52/135754
Int. Cl.² H01L 21/22
U.S. Cl. 29—571 5 Claims



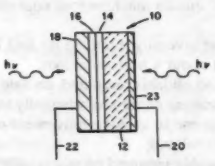
1. A method for manufacturing a semiconductor device comprising the steps of forming a first insulating film on a semiconductor substrate of one conductivity type; boring an opening through said first insulating film to expose part of said substrate; forming a semiconductor layer of the other conductivity type on the exposed surface of said substrate and said first insulating film; selectively removing said semiconductor layer to leave a semiconductor region consecutively connected to said exposed surface on said first insulating film; covering said semiconductor region with a second insulating film; boring an opening through said second insulating film and introducing through said opening an impurity of said one conductivity type into said semiconductor region; and forming electrodes on said semiconductor region and said semiconductor substrate.

4,190,950

DYE-SENSITIZED SOLAR CELLS

Terje A. Skotheim, Berkeley, Calif., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Division of Ser. No. 802,399, Jun. 1, 1977, Pat. No. 4,105,470. This application Mar. 24, 1978, Ser. No. 889,688
Int. Cl.² B01J 17/00
U.S. Cl. 29—572 9 Claims



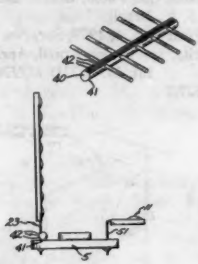
1. A method of fabricating a solar cell, including the steps of:
applying an ohmic contact onto one face of a semiconductor;
adsorbing a sensitizer onto another face of the semiconductor, said sensitizer having a ground state within the bandgap of the semiconductor and a first excited state above the conduction band edge of the semiconductor;
applying a reducing agent over said sensitizer, said reducing agent having a ground state that is above the ground state of said sensitizer; and
coating said reducing agent with a metal.

4,190,951

METHOD FOR FACILITATING ATTACHMENT OF WIRES TO A MOTHERBOARD

James J. Armstrong, Seekonk, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 747,653, Dec. 6, 1976, Pat. No. 4,104,702. This application Feb. 21, 1978, Ser. No. 879,181
Int. Cl.² H01R 43/04
U.S. Cl. 29—628 2 Claims



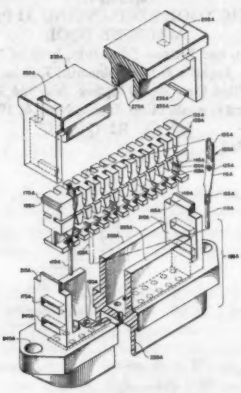
1. A method of attaching a switching assembly to a motherboard, the switching assembly having a plurality of electrically conductive wires extending from the assembly in a direction parallel to a given axis comprising the steps of forming an elongated bar of deformable material, locating the bar a selected distance from and transversely across the free end of the wires, placing the wires into contact with the bar and then deforming the bar to at least partially embed each of the wires in the bar.

4,190,952

INSULATION DISPLACEMENT CONNECTOR ADAPTER

Philip J. Thomas, Costa Mesa, and John A. McAllister, Mission Viejo, both of Calif., assignors to Circuit Assembly Corp., Costa Mesa, Calif.

Filed Jun. 27, 1978, Ser. No. 919,462
Int. Cl.² H01R 43/00, 43/04
U.S. Cl. 29—629 5 Claims



1. A method for fabricating a connector comprising:
forming a plurality of conductive inserts having a readily bendable central portion;
forming an insert guide having a plurality of insert receptacle areas, each of said receptacle areas having a different configuration from others of said receptacle areas and

adapted to bend said central portion of any one of said conductive inserts to such configuration in an amount dependent upon its location in said guide; and

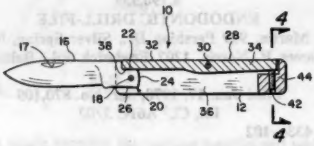
inserting any one of said plurality of conductive inserts into any one of said receptacle areas, said insertion forcing said central portion of said one insert to bend conforming to said configuration of said one receptacle area.

4,190,953

ADJUSTABLE SPRING TENSION POCKETKNIFE

Woodrow W. Naifeh, Rte. 13, Box 380, Tulsa, Okla. 74107

Filed Apr. 24, 1978, Ser. No. 899,502
Int. Cl.² B26B 1/02
U.S. Cl. 30—155 5 Claims



3. An improvement in a folding blade knife having a pair of spaced apart elongated handle members, a knife blade having one end pivotally attached between the handle members at one end thereof, said blade having a cam surface partially surrounding the pivotal attachment, the improvement comprising:

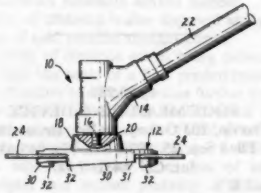
an elongated leaf spring member pivotally attached near its midpoint between the handle members and along one edge thereof, one end of said spring member being in constant engagement with the blade cam surface, an end plate secured between the handle members at the end opposite the knife blade attachment, a threaded bore provided through the end plate substantially transverse to the spring member and perpendicular to the pivotal axis of the spring member, a recessed set screw threadably disposed in the bore, one end thereof being contactable with the end of the spring member.

4,190,954

CUTTING HEADS

Joseph J. Waltc, Chaska, Minn., assignor to The Toro Company, Bloomington, Minn.

Filed Jun. 29, 1978, Ser. No. 920,347
Int. Cl.² A01D 55/18; A01G 3/06
U.S. Cl. 30—347 9 Claims



1. Apparatus for cutting vegetation and the like comprising:

(a) a head member adapted to be removably affixed to a rotatable shaft and rotated about an axis generally perpendicular with a cutting plane;

(b) retaining means mounted on the underside of said head member;

(c) at least one non-metallic flexible line member removably retained on the underside of said head member by said retaining means, wherein at least a portion of said line member extends into said cutting plane; and

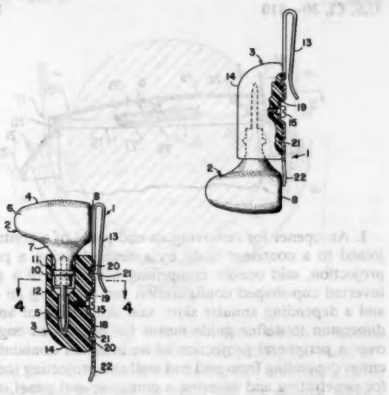
(d) at least one ramp member affixed to the periphery of the underside of said head member, said ramp member being adapted to protect said retaining means from hitting obstructions in said cutting plane during operation of said apparatus; wherein said retaining means comprise a plurality of opposed and cooperating ear members which are adapted to engage and secure said flexible line member against radial displacement from said head member.

4,190,955

GOLF TEE AWL AND PIVOTED SHEATH

Harold E. Rushforth, 1981 Monument Rd., NW, Canton, Ohio 44709

Filed Sep. 11, 1978, Ser. No. 941,286
Int. Cl.² B26F 1/00
U.S. Cl. 30—366 7 Claims



1. The combination of a golf tee awl for making holes the ground for inserting golf tees and a pivoted sheath comprising:

(A) a handle portion to be held in the hand of the user;

(B) a shank portion having one end thereof attached to the handle portion;

(C) the opposite end of the shank portion having a sharpened point to provide ease of penetration into the ground when pressure is exerted against the handle portion;

(D) the handle portion having at least one flat surface lying in a plane parallel to the longitudinal axis of the handle and shank portion; and

(E) a sheath for attachment to the golf tee awl comprising;

(1) a substantially tubular member having an axial receptacle therein for receiving the shank portion;

(2) an elongated clip having a first portion pivotally attached to the exterior of the tubular member in parallel alignment with the axis thereof and a second portion folded over against the first portion, the clip being adapted to receive the belt of a wearer between the first and second portion thereof,

(3) the tubular member being rotatable about its pivotal connection with the clip from a first vertical position in which the shank receiving end is facing upwardly when the clip is placed on the belt of a person using the awl and sheath, to a second vertical position in which the shank receiving end of the tubular member is extending downwardly,

(4) said tubular member being moved to the first position for receiving and carrying the awl in the sheath, and being moved to the second position for removing the awl from the sheath by pulling downwardly on the awl, and

(5) means releasably retaining the tubular member in either the first or second position with respect to the clip.

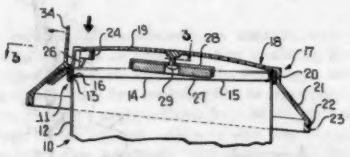
(6) wherein the means retaining the tubular member in the first or second position is at least one indentation in the surface of the tubular member and a dimpled projection on the first portion of the clip, said indentation being brought into register with the projection when the tubular member is rotated to one of the said positions.

4,190,956

CAN OPENER

Carmen T. Mascia, Clarendon Hills, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Aug. 31, 1978, Ser. No. 938,619
Int. Cl.² B67B 7/30
U.S. Cl. 30—410 **10 Claims**



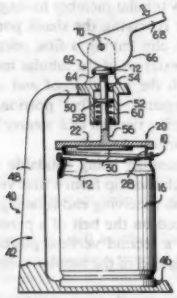
1. An opener for removing an end panel of a container end joined to a container body by a seam defining a peripheral projection, said opener comprising a housing of a generally inverted cup-shaped configuration and including an end wall and a depending annular skirt, said skirt being of an internal dimension to define guide means for telescoped engagement over a peripheral projection of an intended container size, a cutter depending from said end wall and projecting therebelow for penetrating and severing a container end panel, said skirt being interrupted and including a skirt portion resiliently mounted for radial movement and defining retaining means for movement into retaining engagement beneath a container peripheral projection, said skirt portion being disposed circumferentially adjacent said cutter.

4,190,957

CONTAINER OPENER AND METHOD OF UTILIZING THE SAME

Gary K. Hasegawa, Chicago, and Carmen T. Mascia, Clarendon Hills, both of Ill., assignors to The Continental Group, Inc., New York, N.Y.

Filed Jul. 28, 1978, Ser. No. 929,090
Int. Cl.² B67B 7/30
U.S. Cl. 30—411 **5 Claims**



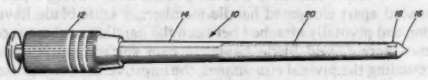
1. A method of opening a container comprising the steps of providing a container wall with a continuous line of weakening defining a removable panel, supplying a closure having a depending blade of a configuration corresponding to that of the line of weakening and tapering in height, positioning the closure in overlying relation to the container wall and aligning the blade with the line of weakening, and utilizing the closure both as a shield and a force applying member moving the blade in a straight line directly towards the container wall, and rupturing the container wall along the line of weakening, the continuous line of weakening being formed in a container end panel surrounded by a projecting seam, and the closure being engaged with the projecting seam to limit the penetration of the blade.

4,190,958

ENDODONTIC DRILL-FILE

Howard Martin, 909 Pershing Dr., Silver Spring, Md. 20907, and James P. Norris, 1207 Frederick Rd., Baltimore, Md. 21228

Filed Jan. 17, 1978, Ser. No. 870,109
Int. Cl.² A61C 5/02
U.S. Cl. 433—102 **6 Claims**



1. An endodontic drill-file, comprising:

a memoried flexible shaft means of very thin configuration, said memoried flexible shaft having a tapered end, said memoried flexible shaft means having a memory which returns said flexible shaft means to an original straight position of configuration from a curved position, said curved position being assumed when inserted in a curved root canal of a human tooth, when said flexible shaft means is removed from said curved root canal, and further, said memory to return said flexible shaft means to an original straight position of configuration being maintained when said flexible shaft means is rotated within said curved root canal of a human tooth and in said curved position, said curved position being assumed when inserted in said curved root canal, said curvature being transferred progressively in small increments around the periphery of said flexible shaft; and

a cutting means on the surface of said flexible shaft means.

4,190,959

FOOT MEASURING DEVICE

Herbert S. Darvin, 203 Oakwynne Rd., Broomall, Pa. 19008

Filed Sep. 25, 1978, Ser. No. 945,632
Int. Cl.² A43D 1/00
U.S. Cl. 33—3 B **3 Claims**

1. An electronic device for measuring and exhibiting the length and width of a human foot, said device comprising, a base, a first slidable member movable on said base and adapted to be placed in contact with the end of a foot supported by said base, a second slidable member movable on said base and adapted to be placed in contact with the side of said foot, said slidable members being independently slidable relative to each other, a first reference member located at one end of said base for positioning of the heel and a second reference member located on said base perpendicular to the first reference member for positioning of one side of the foot, said reference members establishing the reference planes for the measurement of the foot, electronic means responsive to the placement of said

slidable members, and changeable character alpha-numeric display means responsive to said electronic means adapted to

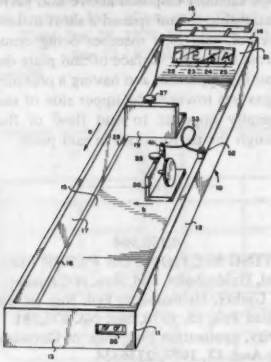


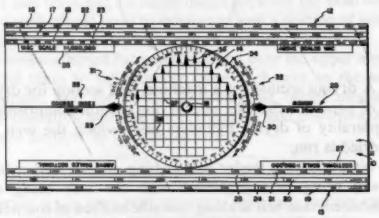
exhibit at a single location the various lengths and widths of a foot.

4,190,960

PLOTTER

Louis A. Warner, 5824 N. Ottawa, Chicago, Ill. 60631

Continuation of Ser. No. 827,164, Aug. 23, 1977, abandoned.
This application Dec. 4, 1978, Ser. No. 966,312
Int. Cl.[2] G01C *21/20*
U.S. Cl. 33—1 SD **5 Claims**



1. A navigational plotter comprising:

an elongated straight edge member having two parallel straight edges opposite one another, and

a circular protractor rotatably affixed thereto,

a first plurality of distance scales disposed along and adjacent to one of said parallel straight edges,

said first plurality of distance scales being calibrated in accordance with the scale of a first predetermined type of chart, said plurality of distance scales further being spaced apart so as to provide a clear, unobstructed course line window between adjacent ones of said plurality of distance scales, a second plurality of distance scales disposed along and adjacent to the other one of said parallel straight edges, said second plurality of distance scales along and adjacent said other one of said parallel edges being calibrated in accordance with the scale of a second predetermined type of chart and spaced apart so as to provide a clear, unobstructed course line window between adjacent ones of them,

said first and second plurality of distance scales being printed on one side only of said straight edge member,

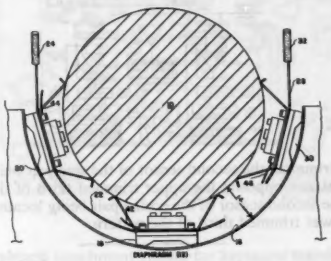
said circular protractor having a compass rose thereon about its periphery and the diameter of said circular protractor being proportioned smaller than the distance between the most closely adjacent ones of said distance scales along and adjacent the opposite ones of said parallel straight edges, whereby none of the plurality of distance scales are obscured by the circular protractor, and a course line indicia on said straight edge member in operative relationship with said circular protractor, whereby said circular protractor can be used to determine a course direction when either one of the two straight edges and the associated plurality of distance scales are used.

4,190,961

METHOD AND APPARATUS FOR ALIGNING TURBINE INTERNAL COMPONENTS

Reginald S. James, Winchendon; Thomas M. Grier, and Robert D. Schmidt, both of Fitchburg, all of Mass., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 14, 1978, Ser. No. 933,176
Int. Cl.[2] G01B *7/30*
U.S. Cl. 33—180 R **7 Claims**



1. A method of aligning a turbine rotor within a turbine casing relative to an annular surface comprising the steps of:

mounting the rotor in the lower casing half whereby a radial gap is defined between the rotor and the annular surface around a portion of the rotor circumference;

calibrating a plurality of test probes in order to obtain a common datum;

inserting said calibrated test probes into the radial gap around the circumference of the rotor for measuring the radial distance from each test probe to the rotor surface; and,

adjusting the position of the annular surface so that the radial distances between each test probe and the rotor surface are the same.

4,190,962

NAVIGATION DEVICES

Harold T. Lyman, Jr., 75 Bryan Hill Rd., Milford, Conn. 06460

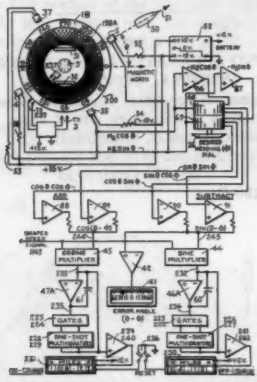
Filed Apr. 6, 1978, Ser. No. 894,103
Int. Cl.[2] G01C *21/08*
U.S. Cl. 33—363 K **3 Claims**

1. Improved means for obtaining voltages proportional to the sine and cosine of the angle between the zero angle reference line on a rotatable card or dial and a fixed external reference line, said means comprising a prescribed variable density optical pattern cone on the card or dial, the angular density relation of the cone being expressed by the equation:

$$D' = K_1 + K_2 \cos \theta$$

Where K_1 and K_2 are constants of proportionality not necessarily equal to each other, and θ is the angle referenced to the darkest portion of the pattern, the pattern cone having sufficient extent in angle perpendicular to the plane of the card or dial that one-third of the angle can be used for trimming the sine signal and one-third can be used for trimming the cosine signal, with adequate provision for reasonable card or dial tilt without effect on sensor output, a light source illuminating the cone, orthogonal pairs of photo-sensors connected differentially in circuit so as to balance out constant voltages due to diffuse or background illumination or unavoidable minimum

pattern density and yielding output voltages proportional to the sine and cosine of the above said angle, one sensor of the sine pair and one sensor of the cosine pair being located on the median plane of the light source and the cone pattern so as to



be untrimmed, the second sensor of the sine pair being located for instance opposite the upper trimmed third of the pattern, and the second sensor of the cosine pair being located opposite the lower trimmed third of the pattern.

4,190,963

CLEANSING DEVICE FOR FLUIDIZED BED REACTORS

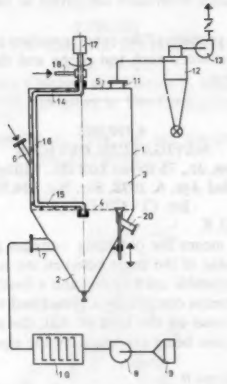
Mogens A. Christensen, Virum, Denmark; Svend Hovmand, Ellicott City, Md.; Jens K. Laursen, Holte, and Henrik B. Mortensen, Birkerod, both of Denmark, assignors to A/S Niro Atomizer, Soborg, Denmark

Filed Feb. 24, 1978, Ser. No. 880,744

Claims priority, application Denmark, Feb. 25, 1977, 830/77

Int. Cl.[2] F26B *3/08*

U.S. Cl. 34—57 A **6 Claims**



1. In a fluidized bed reacting apparatus for processing a powdered product and including a chamber having inlet means for said product, at least one perforated powder supporting plate arranged in a substantially horizontal plane in said chamber, and means arranged in a portion of the chamber below said plate for producing a flow of fluidizing gas upwardly through the perforations in said plate for the formation of a fluidized layer of said product through part of the height of said chamber overlying said plate, an improved movable pneumatic cleansing device for removing depositions of said product from one or more wall faces of said chamber by directing gas jets towards said wall faces, which cleansing device is connected with drive means and supply means for gas, characterized by: at least one pipe member disposed above said perforated plate in parallel relationship to and spaced a short distance from the upper side thereof, said pipe member being constructed for movement across the upper surface of said plate during operation of said reacting apparatus and having a plurality of nozzles for directing gas jets towards the upper side of said plate in a direction generally opposite to said flow of fluidizing gas upwardly through the perforations in said plate.

4,190,964

WEB DRYING SECTION FOR PAPER MACHINE

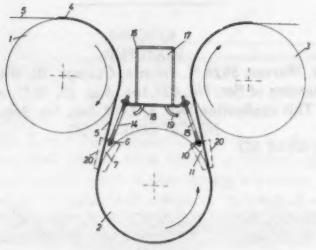
Christian Schiel, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Feb. 15, 1978, Ser. No. 877,981

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1977, 2712184; Aug. 12, 1977, 2736334

Int. Cl.[2] F26B *13/08*

U.S. Cl. 34—114 **16 Claims**



1. A drying section for a machine, said section for drying a web of paper, or the like; said drying section comprising:

a plurality of drying cylinders over which the web to be dried is run;

an air permeable feeder belt passing around said cylinders and being in engagement with the web being dried, wherein said belt is along one side surface of the web and said belt is on that said surface of the web for said belt to be between the web and one said drying cylinder;

with respect to the motion of the web over said one cylinder, said one cylinder having an entrance side at which said belt first contacts said one cylinder and having an exit side at which said belt disengages from said one cylinder;

at said entrance side of said one cylinder, an entrance side gusset being defined at and just before the line across said one cylinder of initial engagement between said belt and said one cylinder;

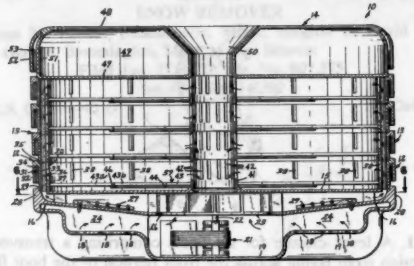
entrance side air lock means extending substantially across the entire length of said one cylinder and placed at the entrance side of said entrance side gusset spaced from the line of initial contact between said belt and said one cylinder for preventing air from penetrating into the entrance side gusset space which is defined inside said entrance side gusset and which is defined by said entrance side air lock means, said belt and said one cylinder;

said one cylinder and said feeder belt both inherently having respective air boundary layers over their surfaces which layers are carried along by them as they move and which layers would normally move with them into said entrance side gusset space; said entrance side air lock means being shaped to extend into and to block the air flow along at least one of the boundary layers entering said entrance side gusset space.

4,190,965
FOOD DEHYDRATOR

Chad S. Erickson, Minneapolis, Minn., assignor to Alternative Pioneering Systems, Inc., Minneapolis, Minn.

Filed Jan. 15, 1979, Ser. No. 3,473
Int. Cl.[2] F26B *25/18*
U.S. Cl. 34—196 6 Claims



1. A food dehydrator comprising:

base means including inlet means for receiving a flow of air from the atmosphere, means for positively moving said air flow through the food dehydrator, and means for heating said air flow;

a plurality of circular vertically stackable trays;

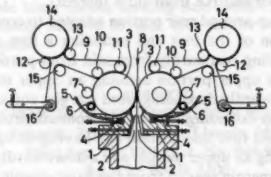
each of said trays including duct means along the circumference of each of trays to permit said air flow to pass from said base means to each of said trays, air inlet means along the circumference of each of said trays to provide that a portion of said air flow moves axially inwardly along each of said trays and air outlet means adjacent the axial center of each of said trays to exhaust at least a portion of said air flow to the atmosphere; and

top means adapted for superimposing over the upper most of said trays to substantially close such tray to the atmosphere, said top means including air outlet means for cooperation with the outlet means of said trays to exhaust said air flow to the atmosphere.

4,190,966
WIPING AND DRYING DEVICE FOR AN INLET SEAL ROLLS ON A HIGH PRESSURE STEAMER

Yoshikazu Sando, and Hiroshi Ishidoshiro, both of Wakayama, Japan, assignors to Sando Iron Works, Co. Ltd., Wakayama, Japan

Filed May 4, 1978, Ser. No. 902,688
Claims priority, application Japan, May 23, 1977, 52/59682
Int. Cl.[2] D06B *23/18*
U.S. Cl. 34—242 6 Claims

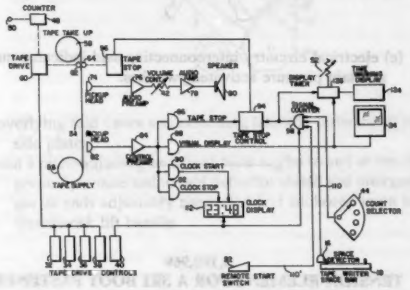


1. A wiping and drying device for an inlet seal roll located on a high pressure steamer which is utilized for treating fiber products, comprising cleaning and wiping means arranged to contact directly a part of the surface of the seal roll and means disposed in direct contact with said cleaning and wiping means and located in spaced relation to the inlet seal roll for drying said cleaning and wiping means so that the cleaning and wiping means are dry when said means contact the inlet seal roll.

4,190,967
KEYBOARD ATTACHMENT SYSTEM AND METHOD FOR KEYBOARD TRAINING

Robert J. Ruegg, 4 Foley Pl., Huntington Station, N.Y. 11746, and Elliott P. Smith, 2908 Mattahoon Rd., Wilmington, Del. 19808

Filed Jun. 12, 1978, Ser. No. 914,587
Int. Cl.[2] G09B *13/04*
U.S. Cl. 35—6 32 Claims



1. A keyboard attachment system for keyboard training for use in conjunction with any existing keyboard device having an actuatable element designated to indicate end of response and means for providing a pre-set number of actuations of said designated element comprising, sequential feed means for recorded instructional material, means responding to a signal associated with recorded instructional material for periodically stopping the device, and start signal generating means connected to the sense stimulating instructional device to generate a start signal in response to said pre-set number of actuations of the designated element including means attachable to keyboard device and actuatable by the normal use of the designated actuatable element in conventional keyboarding activity.

26. The method of training a student in the use of a keyboard device comprising,

providing a student with a device for attachment to any existing keyboard device having an actuatable element,

designating said actuatable element to indicate end of response,

setting a number of actuations of the designated element,

providing dictation for the student to use the keyboard device including a final operation involving actuating the designated keyboard element,

timing the student in his exercise of the instructions,

terminating timing upon the student's completion of a timed learning segment.

4,190,968
TRAINING DEVICE FOR HORSEMANSHIP

Ronald E. Clapp, 12918 Marine Ave., Creve Coeur, Mo. 63141, and David L. Cunningham, 2238 Murray Forest Dr., Maryland Heights, Mo. 63043

Filed Oct. 4, 1978, Ser. No. 948,420
Int. Cl.[2] G08B *21/00*
U.S. Cl. 35—29 R 1 Claim

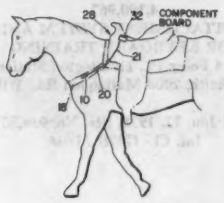
1. A device useful in connection with teaching horsemanship comprising in combination:

(a) a first pressure activated switch,

(b) a second pressure activated switch,

(c) means for supporting said first pressure activated switch closely adjacent the left chest-shoulder area of a horse and for supporting said second pressure activated switch closely adjacent the right chest-shoulder area of a horse,

(d) an indicator means mounted on a portion of the horse where it can be easily viewed by a rider of the horse, and



(e) electrical circuitry interconnecting said indicator means and said pressure activated switches.

4,190,969

TENSION ELEMENT FOR A SKI BOOT FASTENER

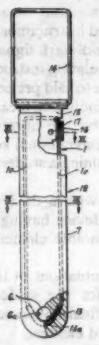
Loris Baso, Corso Milano Nr. 43, Padova, Italy

Filed Jun. 2, 1978, Ser. No. 911,835

Claims priority, application Italy, Jun. 3, 1977, 41616 A/77; Jul. 5, 1977, 41635 A/77

Int. Cl.[2] A43B *11/00*; A43C *11/00*

U.S. Cl. 36—50 **9 Claims**



1. In a tension element for a ski boot fastener, comprising a cable which is formed into a loop and is surrounded at least partially with a flexible plastic, the ends of which cable are connected through a tube-shaped compressed-lock element and at one end of the loop there is provided a substantially U-shaped clasp of a rigid material for hanging on a tensioning lever which is mounted on the ski boot and a connecting means for connecting the loop to the ski boot engages on the second end of the loop, the improvement comprising the cable loop being arranged substantially inside of a plastic band which extends to the clasp such that the cable pieces which are provided between the ends extend substantially parallel and spaced from one another, the space which lies between the cable pieces being filled out with plastic, which also surrounds the cable pieces and forms a web between the same, the plastic band having a hole at the second end for passage of a rivet which serves as a joint, the cable loop being arranged near the edge of said hole and surrounding approximately half of the hole.

4,190,970

LEVER CLOSURE FOR SKI BOOTS

Giuseppe Annovi, Montebelluna, Italy, assignor to Calzaturificio Giuseppe Garbuio S.A.S., Treviso, Italy

Filed Jun. 13, 1978, Ser. No. 915,150

Claims priority, application Italy, Jun. 13, 1977, 84134 A/77

Int. Cl.[2] A43B *11/00, 5/04*; A43C *11/00*

U.S. Cl. 36—50 **10 Claims**

1. A lever closure for ski boots comprising a transverse tension strap laying across the front portion of the boot forwardly of the leg, a closure lever mounted on the rear of the boot, and an element interconnecting opposite ends of the tension strap with said closure lever, said element being engaged with the boot between the lever and said tension strap in such a manner that tension forces transmitted through said element are directed to the tension strap longitudinally thereof and downwardly.

4,190,971

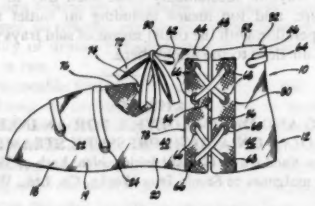
KARATE FOOT PROTECTOR

Fred H. Wren, Jr., and Frank H. Babcock, III, both of St. Louis, Mo., assignors to Pro-tect, Inc., St. Louis, Mo.

Filed Jul. 18, 1978, Ser. No. 925,807

Int. Cl.[2] A43B *5/00*; A41D *17/00*

U.S. Cl. 36—106 **8 Claims**



1. A foot protector for karate combat comprising:

(a) a unitary body formed from a resilient foam core having a flexible outer casing, the body including,

(1) a front portion adapted to cover the upper portion of the foot and the front sides thereof,

(2) a wrap-around rear portion adapted to cover the ankle portion of the foot and including a first side portion extending rearwardly from said front portion and having an upper portion defining an upper margin and a downwardly depending front margin, and a second side portion extending rearwardly from said front portion to join said first side portion and having an upper portion defining an upper margin and a downwardly depending front margin spaced from the front margin of said first side portion,

(3) an open bottom portion defined by a lower margin,

(4) said second side portion being formed into two at least partially separable parts to define adjacent substantially vertical margins disposed in side-by-side relation, and

(5) said first side upper portion including spaced front and rear lace openings and said second side upper portion including spaced front and rear lace openings and a

plurality of lace openings adjacent each vertical margin, and

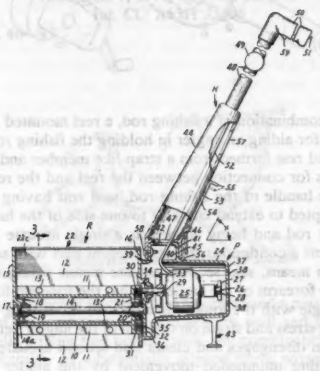
(b) a lace received by said lace openings to connect the separable parts together and to substantially encircle the ankle and tie together adjacent front margins tending to pull said margins toward each other.

4,190,972

SNOW REMOVER

John M. Berner, Minneapolis, Minn., assignor to David H. Garven, Bloomington, Minn., a part interest

Filed Jun. 17, 1977, Ser. No. 807,375
Int. Cl.[2] E01H *5/00*
U.S. Cl. 37—43 D **58 Claims**



1. A powered device comprising supporting structure,

powered tool means supported by said structure having a predetermined operational direction with respect to its own operative components and structural design,

means supported by said structure for powering said tool means, and

main stem handle means supported by said structure for manually directing the movements of said structure,

said handle means having a longitudinal axis,

said tool means having a mounting means upon which said handle means is mounted to be movable relative to said tool means about a vertical axis between a first position in which said axis lies in a plane which parallels said operational direction and a second position in which said longitudinal axis lies in a plane which is substantially perpendicular to said operational direction, said longitudinal axis being offset in angular relationship with respect to said vertical axis,

said handle means being immovable relative to said tool means about a horizontal axis, and

releasable latch means holding said handle means against movement relative to said tool means in each of said positions.

4,190,973

SNOW BLOWER DEFLECTOR SHIELD

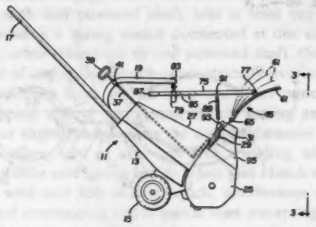
Robert D. Schmidt, 31606 Haldane, Livonia, Mich. 48152

Filed Sep. 29, 1978, Ser. No. 946,949
Int. Cl.[2] E01H *5/00*
U.S. Cl. 37—43 R **11 Claims**

1. In a transportable snow blower having a framework with a lift handle, a laterally adjustable vane shifter plate, and a series of parallel spaced angularly shiftable upright vanes for delivering streams of snow forwardly and laterally between a pair of side plates;

the improvement of a snow deflector shield assembly comprising an elongated laterally extending vane cap plate overlying and secured to said vane shifter plate and laterally adjustable therewith;

a flexible forwardly arcuate deflector shield along one edge hingedly connected to said cap plate along one edge thereof;



overlying said vanes and extending laterally outward of said side plates;

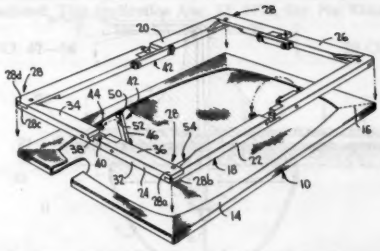
and a pitch-adjusting handle at right angles to and at one end pivotally connected to said deflector shield and intermediate its ends adjustably supported and anchored upon said framework lift handle.

4,190,974

ARTISTS' CANVAS AND FRAME ASSEMBLY

Todd L. Siler, 43-49 10th St., Long Island City, N.Y. 11101

Filed Jun. 21, 1978, Ser. No. 917,565
Int. Cl.[2] D06C *3/08*
U.S. Cl. 38—102.9 **10 Claims**



1. An artists' canvas stretching assembly comprising:

(a) a canvas having edges and a rear face and having a pocket formed at the edges and disposed on the rear face;

(b) an articulated frame composed of pivotally interconnected bars adapted to be disposed on the rear face and movable from a collapsed position into an expanded position wherein the bars are fitted into the pocket so as to apply a stretching force in all directions on the canvas;

(c) said bars having pivotally connected complemental outer ends, each bar being composed of at least two sections having outer ends constituting the outer ends of the bars and having inner complemental ends, means hingedly connecting the inner ends together for pivotal movement about an axis parallel to the axis of pivotal movement of the outer ends; and

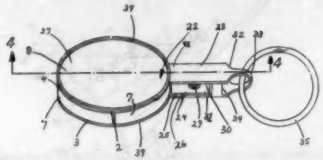
(d) latching means carried by the bars for locking the frame in a fully expanded state within the canvas pocket.

4,190,975

ADVERTISING OR NOVELTY DEVICE

Kent D. Murphy, 4716 Bradley Blvd., Apt. T-6, Chevy Chase, Md. 20015

Filed Dec. 23, 1977, Ser. No. 864,084
Int. Cl.[2] G09F 3/00
U.S. Cl. 40—2 A 24 Claims



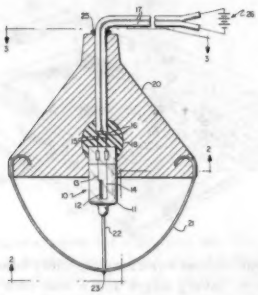
1. An advertising or novelty device comprising, a pair of outer members connected together in spaced relation, at least one inner member positioned said pair of outer members, biasing means connected to normally resiliently bias said inner member into a rest position contained within said pair of outer members, cooperating parts on said inner member and at least one of said outer members, whereby upon squeezing said pair of outer members together, pressure on said cooperating parts moves said inner member laterally outward from said pair of outer members and upon release of squeezing pressure said inner member retracts into said rest position.

4,190,976

FISHING LIGHT

Brian D. Hurt, 712 Red River, Austin, Tex. 78701

Filed Jun. 29, 1978, Ser. No. 920,170
Int. Cl.[2] A01K 97/00
U.S. Cl. 43—17.5 8 Claims



1. A submersible device having means for producing light and sound for attracting fish comprising

a lamp bulb with a quartz envelope, a filament within said envelope and conductive wires extending from said filament through one end of said said envelope; and

a body provided around a first portion of said envelope at said one end through which said wires extend, said body leaves at least a second portion of said envelope adjacent its other end exposed;

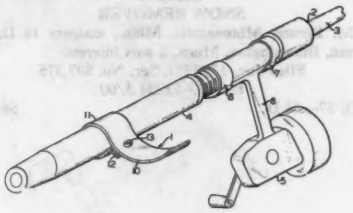
whereby, when the device is immersed in water and said wires are connected to an energy source, said second portion of said envelope is in contact with water to produce both light and sound tending to attract fish.

4,190,977

FOREARM REST FOR FISHING RODS

Robert S. Casper, 104 Maple La., Levelgreen, Trafford, Pa. 15085

Filed Feb. 3, 1978, Ser. No. 874,679
Int. Cl.[2] A01K 87/00
U.S. Cl. 43—21.2 10 Claims



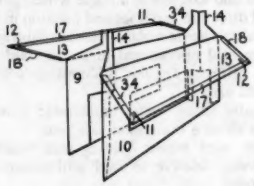
1. The combination of a fishing rod, a reel mounted thereon and a rest for aiding an angler in holding the fishing rod comprising, said rest formed from a strap-like member and having first means for connection between the reel and the rearward end of the handle of the fishing rod, said rest having second means adapted to extend laterally to one side of the handle of the fishing rod and being shaped as a single arcuate portion which forms a continuous smooth integral part with said first connection means, said second acruate means fitting and engaging the forearm of the angler so that the forearm forms an oblique angle with the longitudinal axis of the fishing rod for preventing stress and strain on the arm of the angler yet so that the forearm disengages and clears said second arcuate means for permitting unimpeded movement by the angler during casting.

4,190,978

COLLAPSIBLE PLAYHOUSE MADE OF TWO EQUAL PARTS

Donald C. Nelson, 312 Belmont Ave., Mt. Pocono, Pa. 18344

Continuation of Ser. No. 800,002, May 24, 1977, abandoned.
This application Jan. 10, 1978, Ser. No. 868,309
The portion of the term of this patent subsequent to Aug. 31, 1993, has been disclaimed.
Int. Cl.[2] A63H 33/00
U.S. Cl. 46—12 1 Claim



1. A simple collapsible playhouse:

made of two equal parts, each said part comprising one rectangular side wall, two half end walls connected by fold lines at respective ends of said side wall and a half roof connected by a fold line to the upper longitudinal edge of said sidewall, each said half end wall having a bottom edge perpendicular to its associated fold line, an end edge substantially parallel to but longer than said associated fold line and a straight upper edge portion inclined upwardly from said associated fold line, said upper edge portion terminating in a short rectangular projection parallel to said end edge, said half roof having a free edge parallel to and longer than its associated fold line, and having a slot at each end extending perpendicu-

larly to said free edge, each said part having means at at least some of the free edges for finishing the edges to protect the user against cuts and the like; means permanently connecting both the end edges of said half end walls to one another so that the playhouse may be moved from a collapsed position, wherein the end walls are folded between the side walls, to an erected position wherein the end walls are perpendicular to said side walls and said half roofs overlie said end wall upper edges with the projections on said end walls received in said slots.

4,190,979

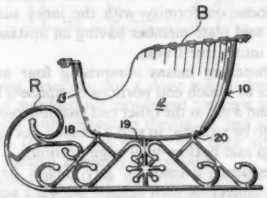
TOY SLEIGH

Monroe J. Singer, 9000 SW. 64th St., Miami, Fla. 33173

Filed Dec. 7, 1978, Ser. No. 967,644

Int. Cl.[2] A63H *33/06*

U.S. Cl. 46—17 **3 Claims**



1. In a toy sleigh having a body portion and a pair of runners and said body portion having a bottom wall and plurality of side walls joining said bottom wall, the combination comprising a plurality of substantially aligned bores adjacent to said side walls, said runners having a plurality of substantially aligned stems extending through said bores and a boss mounted on the free end of said stems forming a shoulder engaging the inner surface of said bottom wall whereby said runners are releaseably secured to said body portion.

4,190,980

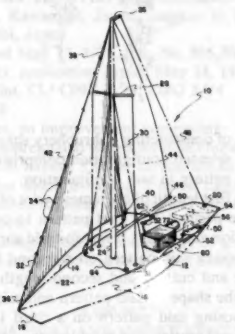
MODEL SAILBOAT SHEET WINCH

Felix J. Grycel, 1404 Jackson, Port Townsend, Wash. 98368

Filed Jan. 23, 1978, Ser. No. 871,344

Int. Cl.[2] A63H *23/02*

U.S. Cl. 46—93 **7 Claims**



1. A means to remotely manipulate at least one sail on a model sailboat to maneuver said sailboat upon a body of water comprising:

a housing,

at least one sheet winch rotatable on a powered shaft positioned within said housing, said at least one sheet winch is free-wheeling on said shaft, the end of a sheet wound on said at least one sheet winch being attached to the clew of said at least one sail, the other end being connected to said sheet winch,

at least one clutch mechanism means driven by said powered shaft positioned adjacent said at least one free-wheeling sheet winch to engage said at least one free-wheeling sheet winch with said powered shaft, said at least one clutch mechanism is a spring clutch connected at one end to a driving arbor connected to said powered shaft, the opposite end of said spring clutch concentrically overlapping a hub extending from said at least one sheet winch, said overlapping end of said spring clutch having an inside diameter slightly larger than the outside diameter of said hub to allow said at least one free-wheeling winch to rotate within said spring clutch when said clutch is disengaged with said hub of said winch, interference contact with said overlapping end of said at least one spring clutch by said means to simultaneously engage or disengage said winch results in the coils of the spring to retract thereby reducing the inside diameter of the overlapping end thus engaging the hub of said sheet winch,

means mounted to said housing to remotely start and stop said powered shaft to drive said at least one sheet winch, and

means to simultaneously engage or disengage said at least one free-wheeling sheet winch by said at least one clutch mechanism thereby reeling in or letting out or holding said at least one sail to port or starboard by said remote manipulating means.

4,190,981

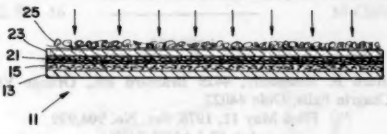
MAT FOR GROWING LAWNS OR OTHER VEGETATION

Lawrence C. Muldner, 13349 McCulloch Ave., Saratoga, Calif. 95070

Continuation-in-part of Ser. No. 828,177, Aug. 26, 1977, abandoned. This application Aug. 23, 1978, Ser. No. 936,052

Int. Cl.[2] A01G *31/00*

U.S. Cl. 47—56 **10 Claims**



1. An improved laminated mat for growing vegetation on soil, comprising,

an outer lower base sheet laminate of water pervious web material, said material being quickly biodegradable to become part of the soil after coming in contact therewith;

a bed of seeds and dried, compressed peat particles, wherein said peat particles are treated to remove dust entrained therewith, means for adhesively securing said bed to said base sheet, said particles being expandable upon wetting to surround and form a mulch for said seeds; and

an outer upper veil laminate of fibrous, unwoven, porous web material and means for adhesively securing said veil to said bed, said veil comprising means for expanding with said expandable peat particles and retaining said particles and seeds integrally in said mat after biodegradation of said base sheet, said veil being slowly biodegradable to become part of the soil after germination and rooting of said seeds.

4,190,982

ASSEMBLABLE TOY FIGURE

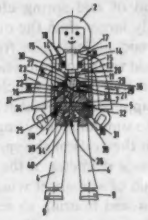
Dietmar Rahmstorf, Nuremberg, Fed. Rep. of Germany, assignor to Messrs. BIG Spielwarenfabrik Dipl.-Ing. Ernst A. Bettag, Fürth, Fed. Rep. of Germany

Filed Dec. 22, 1977, Ser. No. 863,221

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1977, 2700969

Int. Cl.[2] A63H 3/00

U.S. Cl. 46—161 12 Claims



1. In an assemblable toy figure including a hollow trunk divided along a vertical transverse plane into a front portion and a rear portion, a vertical locking bar, a head mounted for rotation about the vertical locking bar which latter extends downwardly from the head and which serves to non-detachably fasten the trunk portions together, two arms and two legs each of which is mounted in the trunk for pivotal movement about a generally horizontal axis, a respective extension at the upper end of each arm serving as a pivotal axis, lateral openings defined in the trunk and traversed by the said transverse plane, said extensions of the arms engaging on assembly in said openings; an opening defined at the front of the trunk into which the legs engage from below and which enables pivotal movement of the legs, and pivot pins forming pivotal axes for the legs; the improvement comprising a journal recess defined in the bottom part of the trunk; and a pivot joint disposed in said recess means including said locking bar non-detachably supporting said pivot joint in the trunk, said pivot joint being journalled for rotation about a vertical axis, the pivot joint including the horizontal pivotal axis of the legs; and wherein the legs are mounted on the pivot joint by means of the said pivot pins and in the assembled use position are secured by a side wall of the journal recess.

4,190,983

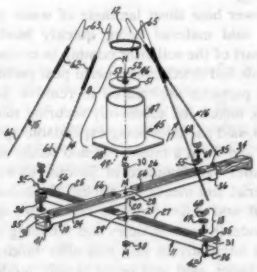
SEVERED-TREE SUPPORT DEVICE

Clifford R. Rostomily, 4429 Brainard Rd., Orange Village, Chagrin Falls, Ohio 44022

Filed May 11, 1978, Ser. No. 904,939

Int. Cl.[2] A47G 7/00

U.S. Cl. 47—40.5 2 Claims



1. A device for supporting a severed tree or other article having a normally vertically extending trunk aligned along a first normally vertical axis of the device comprising:

a platform having a second normally vertical axis and comprising a pair of sills in crossed separable interlocking relationship, said sills being notched at respective crossed portions intersected by said second axis to provide an interlock, fastening means extending axially through said crossed portions to secure and fix said sills in said interlock, each of said sills defining guide means along upper surfaces thereof, at opposite sides of the second axis providing longitudinal slots of inverted T-shaped cross section;

receptacle means approximately centered in said first axis and comprising a top-opening liquid container having a cylindrical side wall and a bottom wall extending radially outwardly from the side wall to define a horizontally-protruding edge portion; and a separable plate member adapted to be inserted into said container onto the bottom wall in loose conformity with the inner surface of the sidewall, said plate member having an upstanding pin for insertion into a tree trunk;

releasable fastening means comprising four nut and bolt assemblies of which end portions comprise a bolt head at one end and a nut at the other end enabling one of said end portions to be received in said T-shaped slot and the other to overlap said bottom-wall edge portion;

elongate resiliently-extendable guy means having lower portions connecting with radially outward portions of all of said sills; and

connecting means for attaching the upper portions of said guy means to a portion of a tree trunk spaced upwardly from said receptacle means.

4,190,984

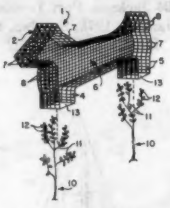
METHOD FOR CONSTRUCTING A SHRUBBERY SHAPER

Wendel D. Pierce, 704 Whittington, Bossier City, La. 71010

Filed May 11, 1978, Ser. No. 904,745

Int. Cl.[2] A01G 17/06

U.S. Cl. 47—58 6 Claims



1. A method of constructing a shrubbery shaper for growing shrubbery in a selected configuration comprising:

(a) cutting a pattern in said configuration;

(b) shaping a first length of open mesh wire of selected width around the perimeter of said pattern to conform to said configuration and form a frame for said shrubbery shaper;

(c) superimposing said pattern on a second length of open mesh wire and cutting said second length of open mesh wire into the shape of said pattern and said frame;

(d) superimposing said pattern on a third length of open mesh wire and cutting said third length of open mesh wire into the shape of said pattern and said frame;

(e) fastening said second length and said third length of said open mesh wire to said first length of said open mesh wire to close said frame; and

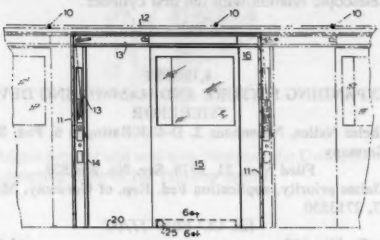
(f) positioning said shrubbery shaper over shrubbery to be trained or shaped, whereby the branches of said shrubbery are located inside said shrubbery shaper.

4,190,985

DOOR LOCKING ASSEMBLY

Lewis B. Richards, Oakland, and Kenneth R. Romick, Hayward, both of Calif., assignors to Washington Universal Security Products, Hayward, Calif.

Filed May 5, 1978, Ser. No. 903,209
Int. Cl.[2] E05B 47/00
U.S. Cl. 49—16 21 Claims



1. A locking assembly for a door installation including a frame, a door mounted for movement between an open and a closed position with respect to the frame, and a jamb associated with the frame at the side of the door where opening occurs, said locking assembly comprising:

locking means associated with the jamb and the adjacent edge of the door, including a lock dog portion associated with the jamb, protruding into the path of the door generally intermediate the top and bottom of the door and vertically movable from a lower locking position to an upper unlocking position;

a vertically oriented drop bar associated with the jamb and fixedly supporting the lock dog portion of the locking means, said drop bar being mounted on the jamb and within an enclosure associated with the jamb for up-and-down travel to move the lock dog portion between the locking and unlocking positions;

rotatable cam means for lifting the drop bar to raise the lock dog portion from locking to unlocking position; and

remotely operable motor means for rotating the rotatable cam means to raise the drop bar and lock dog portion to unlocking position.

4,190,986

WAX TREATED GRINDSTONE

Oide Kunimasa, Kawanishi, Japan, assignor to Daichiku Co., Ltd., Kawanishi, Japan

Filed May 12, 1978, Ser. No. 905,356
Claims priority, application Japan, May 14, 1977, 52/55560
Int. Cl.[2] C09K 3/14; C08J 5/14
U.S. Cl. 51—295 9 Claims

1. In a grinder, an improvement comprising:

a grindstone impregnated with a solution containing a higher aliphatic acid having 5 to 30 carbon atoms per molecule and a higher alcohol having 5 to 30 carbon atoms per molecule mixed together at a range of ratios by weight of 10:90 to 90:10;

whereby grinding efficiency and quality of grinding performance is dramatically and surprisingly improved.

4,190,987

DOUBLE DOME HEAT AND SMOKE VENT STRUCTURE

Edward S. Naidus, Glen Rock, N.J., assignor to RCA Corporation, New York, N.Y.

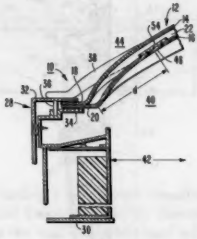
Filed Dec. 5, 1977, Ser. No. 857,760
Int. Cl.[2] E04B 7/18
U.S. Cl. 52—1 8 Claims

1. A vent structure for enclosing a heat and smoke vent opening comprising:

a first heat softenable and heat shrinkable sheet member having a peripheral edge circumscribing said opening,

a second heat softenable and heat shrinkable sheet member having an edge over said peripheral edge of said first member, said second member being positioned spaced from and coextensive with said first member forming a dead space therebetween,

the one of said members facing the heat to be vented through said vent opening and having a plurality of spaced holes



for providing heat circulation to said dead space for softening the other of said members and the other of said members being continuous in the sense it prevents the escape of heat passing into the dead space prior to its softening, and

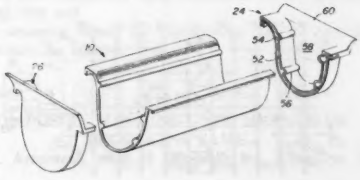
heat softenable heat shrinkable means which opens said holes in response to said heat applied thereto enclosing said holes for enclosing said dead space to provide thermal insulation in the absence of said heat to be vented.

4,190,988

METHOD, SYSTEM AND COMPONENTS FOR PRESERVING WOODEN GUTTERS

Ronald Carreiro, 105 Stratford St., W. Roxbury, Mass. 02132

Filed Jan. 5, 1978, Ser. No. 867,030
Int. Cl.[2] E04D 13/00
U.S. Cl. 52—16 14 Claims



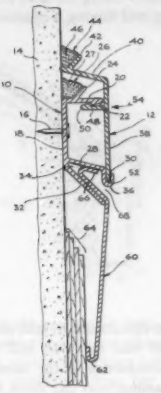
1. A system for weatherproofing the trough of a wooden gutter, comprising

(a) an elongated, waterproof, longitudinally and laterally flexible, soft plastic liner adapted to line the surface of the gutter trough when installed therein, said liner being characterized by a softness and flexibility sufficient for said liner to conform to the contour of said trough when installed therein, and

(b) end caps connectable to the ends of said liner to close the ends thereof,

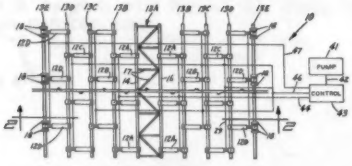
(c) the lower surface of said liner being formed with longitudinal corrugations.

4,190,989
ROOF FLASHING SYSTEM
Albert Sakharoff, 13421 Cheltenham Dr., Sherman Oaks, Calif. 91429
Filed Nov. 15, 1978, Ser. No. 960,960
Int. Cl.[2] E04D 1/36
U.S. Cl. 52—60 11 Claims



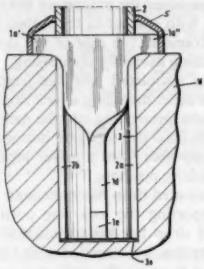
1. A roof flashing system comprising:
a first reglet attachable to a wall and forming a first longitudinally extending trough in conjunction with said wall for containment of a caulking compound; and
a second reglet attachable to said first reglet and forming a second longitudinally extending trough in conjunction with said wall for containment of a caulking compound, said second trough being located substantially parallel to said first trough.

4,190,990
FRAME ASSEMBLY
Jack G. McAllister, 2701 N. Douglas Dr., Minneapolis, Minn. 55422
Continuation of Ser. No. 712,351, Aug. 6, 1976, abandoned, which is a division of Ser. No. 255,688, May 22, 1972, Pat. No. 3,973,370. This application Dec. 5, 1977, Ser. No. 857,435
Int. Cl.[2] E04B 1/32
U.S. Cl. 52—66 24 Claims



1. A frame assembly comprising: a plurality of elongated extended first means arranged over part of a surface, each extended first means having opposite ends and a first member and a second member movable relative to the first member, means for holding the first member and second member of the first means in a fixed elongated relationship relative to each other, anchor means located on said surface connected to each first member of the first means to hold the first member in a stationary location, a plurality of elongated extended second means arranged over said surface, each second means having opposite ends and a first member and a second member movable relative to each other, means for holding the first member and second member of the second means in a fixed elongated relationship relative to each other, first connector means coupling adjacent ends of the extended second means to provide a network of extended second means and first connector means, and second connector means coupling the second members of the first means to part of the second means whereby the first and second means are interconnected to form the frame assembly over said surfaces, said first member of each extended means is an elongated first cylinder and the second member of each extended means is an elongated second cylinder mounted in telescopic relation with the first cylinder.

4,190,991
EXPANDING FIXTURE AND HAMMERING DEVICE THEREFOR
Wilhelm Nelles, Nesenhaus 2, D-4030Ratingen 6, Fed. Rep. of Germany
Filed Mar. 21, 1978, Ser. No. 888,521
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1977, 2713530
Int. Cl.[2] E04F 11/00
U.S. Cl. 52—127 14 Claims

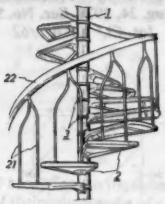


1. An expanding fixture for securing an element to a wall or a ceiling by securing the element to a bore in the wall or ceiling, comprising:
a socket adapted to be driven into the bore in the wall, said socket having a longitudinal slot and a hollow section;
an expanding piece formed of a flat material to penetrate into said hollow section of said socket, said piece including a widening portion at one end and a slot engaging portion at the other end, said widening portion widening said socket and pressing said socket against the wall of the bore, said slot engaging portion including a section which is wider than the diameter of said socket and a part which projects beyond the peripheral portion of said socket on a side thereof opposite to the bore base, said slot engaging portion being supported on the edge of the bore; and
said element to be secured being coextensive with said said socket and extending from said hollow section.

4,190,992
SPIRAL STAIRCASE
Senzo Takenaga, c/o Akebono Kikai Kabushiki Kaisha, Taura Minato-machi, Yokosuka-shi, Kanagawa-ken, Japan
Filed Sep. 18, 1978, Ser. No. 943,120
Claims priority, application Japan, Apr. 20, 1978, 53/45876
Int. Cl.[2] E04F 11/00
U.S. Cl. 52—187 7 Claims

1. A spiral staircase comprising a column of pipe, a plurality of footstep means fixed to the column in a spiral array, supporting means having a U-shaped bolt and nuts, whereby a plurality of footstep means are firmly fixed to the column by clamping the supporting means by the U-shaped bolt and the nuts,

said supporting means including a band-shaped support encircling the column, said U-shaped bolt engaging a pin of the



band-shaped support and said nuts clamping the U-shaped bolt on a supporting plate of the footstep means.

4,190,993

LINER CONSTRUCTION

Joe C. Pohlman, P.O. Box 15098, Pittsburgh, Pa. 15237, and James P. Romualdi, 5737 Wilkins Ave., Pittsburgh, Pa. 15213

Filed Aug. 7, 1978, Ser. No. 931,607
Int. Cl.[2] E04B *1/32*
U.S. Cl. 52—249 **15 Claims**

1. In combination with a stack-like structure having at least an inner wall, a liner comprising:

a plurality of circumferentially spaced elongated rod-like means spaced radially, inwardly from the inner wall of the structure and secured at one of their ends to an upper portion of the structure and extending downwardly within the confines of said structure and over a substantial length of the height of the structure;

a plurality of longitudinally spaced hoop means secured to said rod-like means, whereby said hoop means and said rod-like means together define a framework of open sections;

mesh means secured to said framework; and

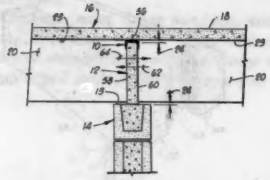
a tubular body of non-metallic settable material having the general physical properties of concrete encasing said mesh and extending over a substantial portion of the height of the structure; said framework, said mesh and said body of settable material constructed and arranged with respect to each other such that a stress-free liner is defined.

4,190,994

FILLER PANEL CLIP FOR PRESTRESSED CONCRETE DOUBLE-TEE ROOF OR FLOOR CONSTRUCTION

Paul A. Marsh, Jr., and Tom A. Thomas, III, both of 5500 S. High, Oklahoma City, Okla. 73129

Filed Dec. 8, 1977, Ser. No. 858,709
Int. Cl.[2] E04C *1/36*
U.S. Cl. 52—262 **7 Claims**



1. In a structure having a double-tee construction member extending over a wall forming a cavity therebetween and a filler panel resting on the wall and positioned within the cavity, the improvement comprising:

clip means connectable to the double-tee within the cavity for retaining the filler panel within the cavity so that the filler panel is retained in the cavity when the double-tee exerts flexing movement relative to the wall, the clip means comprising:

a first retaining portion supportable on the underside of the double-tee;

a second retaining portion; and

locking connector means for connecting the first retaining portion and the second retaining portion in locking engagement so that the first retaining portion provides backup to one side of the filler panel and the second retaining portion provides a backup to the opposite side of the filler panel, the locking connector comprising:

a female connector portion connected to the first retaining portion, the female connector portion comprising a bifurcated clip, a first furcation thereof being connected to the first retaining portion, and the second furcation being connected to and generally parallel with the first furcation with a tab receiving slot being formed between the furcations;

a male connector portion connected to the second retaining portion, the male connector portion being lockingly engagable with the female connector portion, the male connector having a tab connected to the second retaining portion, the tab being insertable into the tab receiving slot; and

tab retaining means for maintaining the tab positioned within the tab receiving slot.

4,190,995

COMPOSITE BUILDING UNIT, METHOD OF PRODUCING SAME

John A. Armistead, 4516-15 Randolph Rd., Charlotte, N.C. 28211

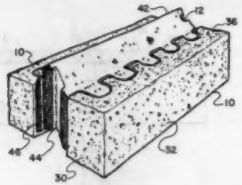
Filed Jul. 26, 1978, Ser. No. 928,164
Int. Cl.[2] E04B *02/00*
U.S. Cl. 52—309.9 **13 Claims**

1. A composite building unit for mortar joint wall construction comprising:

(a) a pair of elements formed of brick-like material, each said element having a facing side with a plurality of inwardly extending recesses therein, each said recess having a constriction adjacent the facing side from which it extends and an enlarged portion spaced inwardly from said constriction said pair of brick-like elements being spaced with the facing sides thereof in opposed facing relationship,

(b) an intermediate element formed of compressibly resilient insulating material disposed between said pair of spaced

brick-like elements and having two opposed side faces with a plurality of projections extending outwardly from each said side face, said intermediate element and said spaced brick-like elements being joined by a press fit with said projections of said intermediate element received within said recesses of said spaced brick-like elements and with said facing sides of said spaced brick-like elements



and said side faces of said intermediate element being adjacent to one another, said projections being relatively compressed at the portions thereof adjacent said recess constrictions and being relatively expanded at the portions thereof located within said enlarged recess portions, said spaced brick-like elements and said intermediate elements being held together by frictional interaction between said projections and said recesses.

4,190,996

CORNERS OF STRUCTURAL MEMBERS

Rudolf Schindler, Ottobrunn, and Werner Hartmann, Munich, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 13, 1977, Ser. No. 860,180

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1976, 2657542

Int. Cl.² E04C 2/22

U.S. Cl. 52—309.13 **7 Claims**

1. A corner of a structural member having a first wall, a second wall and a third wall, said first and second walls disposed at an angle to one another and an edge of each located at a common intersection line between said first and second walls, said third wall extending transversely of said first and second walls and of the common intersection line between said first and second walls, said third wall having one edge thereof forming a common intersection line with said first wall and another edge thereof forming a common intersection line with said second wall, the common intersection lines of said third wall with said first and second walls extend transversely of the common intersection line between said first and second walls, wherein the improvement comprises that each of said first, second and third walls are of equal wall thickness and strength and are formed of at least two fiber reinforced layers, each layer having parallel fibers extending in the same direction and the fibers in one layer extending transversely across the fibers in the adjacent layer.

4,190,997

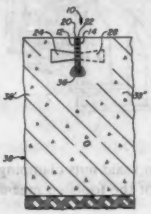
MEANS FOR FORMING AN EDGE-PROTECTED CONTRACTION JOINT

Billie E. Holt, Rte. 1, Box 427, Graham, N.C. 27253

Filed Aug. 24, 1978, Ser. No. 936,563

Int. Cl.² E04B 1/62

U.S. Cl. 52—396 **7 Claims**



1. An assembly for forming an edge-protected contraction joint in a concrete floor or similar structure which undergoes contraction-separation upon curing of the concrete, comprising:

first and second elongate, rigid, wear-resistant metallic members adapted to be embedded within the concrete while the same is in a plastic condition and while the members extend in substantially parallel abutting relationship to each other, and adapted upon curing of the concrete to extend in protective relationship along the length of respective ones of the opposite upper edges of a contraction joint then formed in the concrete by contraction-separation away from each other of first and second sections of the concrete respectively disposed on opposite sides of said first and second members;

each of said members including anchor means extending laterally outwardly from the side thereof distal from the other of said members and into the thereto adjacent one of said concrete sections for, upon contraction-separation of said sections during curing of the concrete, causing each said member to remain in protective engagement with said adjacent one of said concrete sections and to undergo relative lateral movement away from the other of said members;

and interconnecting means for so interconnecting said members as to maintain the same in said abutting relationship to one another while the concrete is in a plastic condition, and as to permit relative lateral movement of said members away from each other during curing of the concrete and in response to then-transpiring contraction-separation of said concrete sections; said interconnecting means including at least one inner-connecting element fixedly secured to one of said elongate members and slidably engageable with the other of said members for preventing vertical and longitudinal relative movement between said members while permitting constrained lateral movement of said members relative to each other.

4,190,998

PIVOTABLY INTERLOCKING RIGID HEAT-RESISTANT TILES

Roger H. Keith, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

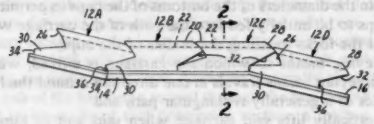
Filed May 12, 1978, Ser. No. 905,152

Int. Cl.² E04B 5/04

U.S. Cl. 52—591 **13 Claims**

1. A rigid, heat-resistant tile having generally rectangular and parallel broad faces which with identical tiles can form an interlocking train or field of tiles wherein the ends of contiguous tiles form knuckle joints comprising mating convex and concave cylindrical surfaces on substantially a common axis that extends parallel to the broad faces of the tile, the tile

having at one end (a) a protuberance which forms part of one face of the tile and (b) a concave cylindrical surface extending from a broad face of the tile to the protuberance and at the other end (c) an indentation and (d) a convex cylindrical surface extending from said broad face to the indentation which is contacted by the apex of the protuberance of a contiguous like tile and is spaced from the base of the protuberance when the contiguous tiles are in collinear alignment.

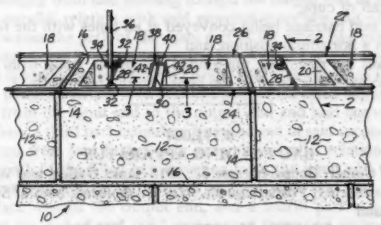


4,190,999

LOCATOR FOR VERTICAL REINFORCING BARS

Ralph C. Hampton, 18881 Gentian, Riverside, Calif. 92504

Filed Apr. 25, 1978, Ser. No. 899,829
Int. Cl.² E04C 5/16
U.S. Cl. 52—687 **4 Claims**



1. A fixture for use in masonary construction utilizing hollow blocks having two longitudinally spaced cavities separated by a transverse web, wherein vertical reinforcing bars must be precisely located within a cavity that is subsequently filled with cement grout, said fixture comprising:

a horizontal supporting structure that is adapted to be placed on the top surfaces of the blocks at various levels of the masonry construction as the blocks are being laid, said supporting structure consisting of a ladder-like unit formed with laterally spaced, parallel wires that are connected together at intervals by cross-wires;

said horizontal supporting structure having a plurality of rings provided thereon at locations where the reinforcing bars are to be located, said rings of the supporting structures at different levels of the masonry construction being vertically aligned with respect to one another so as to receive the vertical reinforcing bars when the latter are passed downwardly into the cavity and through the rings from the top of the completed or partially completed construction; and

certain of said cross wires having cross pieces attached thereto, said cross pieces terminating in downwardly bent legs that are adapted to straddle the transverse webs of the blocks.

4,191,000

WOODEN I-BEAM

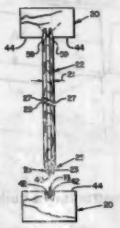
Larry R. Henderson, Portland, Oreg., assignor to Timjoist, Inc., Tualatin, Oreg.

Filed Feb. 27, 1978, Ser. No. 881,599
Int. Cl.² E04C 3/12
U.S. Cl. 52—729 **5 Claims**

1. A wooden I-beam, comprising:

(a) an elongate, generally planar web member of laminated wood having a longitudinal axis, a pair of opposite edges which are generally parallel to said longitudinal axis, each one of said opposite edges having a base plane perpendicular to the plane of said web member and parallel to said one of said opposite edges and a pair of parallel ribs extending from said base plane and having sloping sides and an included groove therebetween, each said rib having a rib edge surface and said included groove having a bottom surface located closer to said rib edge surface than said base plane is located;

(b) a pair of elongate wooden flange members, said flange members being oppositely located along said opposite edges of said web member and each said flange member having a longitudinal surface comprising a pair of lon-



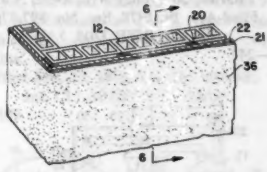
gitudinally-oriented parallel grooves located therein, said parallel grooves having shape and size closely corresponding to that of said ribs and included groove of said web member, and each said flange member being adhesively connected to said web member such that said ribs extend matingly into said parallel grooves with said base plane substantially aligned with said longitudinal surface, forming a joint defining a pair of oblique shear planes, each of said oblique shear planes extending through one of said ribs from the intersection of said longitudinal surface and said one of said ribs to the portion of said bottom surface of said included groove nearest to said intersection.

4,191,001

PROCESS FOR REINSULATING CONCRETE BLOCK HOMES

Gerard L'Heureux, 1506 Dixie Hwy., Holiday, Fla. 33590

Filed Jun. 1, 1978, Ser. No. 911,751
Int. Cl.² E04B 1/62
U.S. Cl. 52—743 **10 Claims**

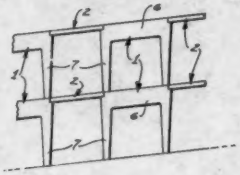


1. A process of insulating a concrete block building comprising the steps of fastening furring strips at spaced parallel positions along the exterior surface of the building; affixing rigid thermal insulating panels to said furring strips about the exterior surface of said wall to provide a moisture-proof wall structure with a dead air space between the panels and the existing concrete block wall; fastening a mechanical reinforcing metal mesh to cover substantially the entire surface of said rigid thermal insulating panels; and forming a concrete surface on said reinforcing metal mesh about the exterior surface of said panels to complete the insulation of the building.

4,191,002
DEMOUNTABLE MULTIPLE LEVEL BUILDING STRUCTURE

Edward K. Rice, Los Angeles, Calif., assignor to Unicon Parking Structures, Inc., Van Nuys, Calif.

Continuation of Ser. No. 340,689, Mar. 13, 1973, Pat. No. 4,065,907, which is a division of Ser. No. 93,097, Nov. 27, 1970, abandoned. This application Dec. 30, 1977, Ser. No. 865,785
The portion of the term of this patent subsequent to Jan. 3, 1995, has been disclaimed.
Int. Cl.² E04C 3/00
U.S. Cl. 52—747 **2 Claims**



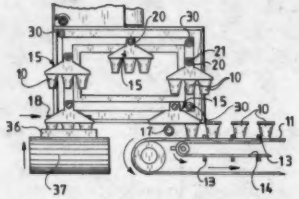
1. A method of constructing a building structure characterized by:
   (a) precasting a set of free-standing supporting modules, each comprising a slab and supporting legs at the extremities thereof, said slabs each having a set of horizontal transverse tendon guideways located therethrough;
   (b) positioning said supporting modules in predetermined spaced relation;
   (c) extending tendons through said guideways located in said slabs of said supporting modules;
   (d) fitting sheaths over the portions of said tendons located between said supporting modules to form tendon guideways;
   (e) providing forms and casting supported modules in the spaces between said supporting modules and around said tendons, each said supported module comprising a slab; and
   (f) applying post-tensioning force to the extremities of said tendons accompanied with corresponding transverse compression force to and through said slabs of said supporting and supported modules,

whereby said supported modules are supported solely by said supporting modules.

4,191,003
TRAY LOADER

Lawrence J. Talarico, 50 Sydney Ave., Deal, N.J. 07723

Filed Apr. 19, 1978, Ser. No. 897,576
Int. Cl.² B65B 5/08, 5/06
U.S. Cl. 53—247 **5 Claims**



1. Apparatus for loading as a unit a plurality of tapered lidded cups containing any of a variety of products into a receptacle comprising:

means for feeding said cups spaced in rows and across into the path of a carriage provided with forks aligned with said rows of cups with a pair of forks for each row of cups, each pair of forks being in fixed parallel relationship with the spacing between such pair of forks being less than the diameters of the tops of the bodies of the cups and greater than the diameters of the bottoms of the cups to permit the cups to be initially fed into the path of the carriage without the forks touching the bodies of the cups;

conveying means to which the carriage is affixed, which conveying means travels in one direction around the four sides of a generally rectangular path and

(a) vertically lifts said carriage when said unit of cups is positioned in the forks and moves the carriage and unit of cups upwardly along the one end of the rectangular path, said lifting causing the forks to contact the bodies of said cups and lift said unit of cups;

(b) moves the carriage and unit of cups along the horizontal top leg of the rectangular path;

(c) moves the carriage and unit of cups downwardly along the opposite end of the rectangular path and deposits the said unit of cups in a vertical discharge onto a receptacle positioned below the descending carriage, the said descent releasing the forks from the bodies of the cups; and

(d) then moves the empty carriage along the horizontal bottom leg of the rectangular path away from the loaded receptacle to the initial starting position to pick up another unit of cups;

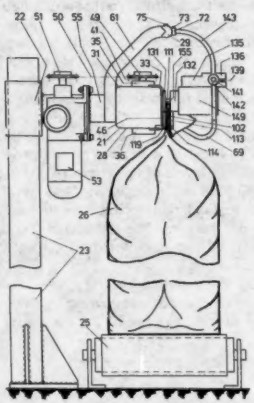
the said carriage being conveyed at all times with the forks in a horizontal position; and

means for removing the loaded receptacle away from the point of discharge of the cups into the receptacle.

4,191,004
BAG FOLDING APPARATUS

Bruno Gmuer, Boppartstrasse 32, 9014 Sankt Gallen, and Willy Grundbacher, Poststrasse 20, 9220 Bischofszell, both of Switzerland

Filed Feb. 23, 1978, Ser. No. 880,360
Claims priority, application Switzerland, Feb. 24, 1977, 2293/77
Int. Cl.² B65B 7/08
U.S. Cl. 53—378 **19 Claims**



1. A bag folding apparatus for folding the region adjacent the open end of a filled bag with the filled bag also having an oppositely located closed end and an axis extending through the closed and open ends, comprising means for conveying the filled bag through a bag closing station having an input and an output end spaced apart by a bag folding zone, said conveying means including a planar conveying surface for supporting the closed ends of the filled bag passing through the bag closing

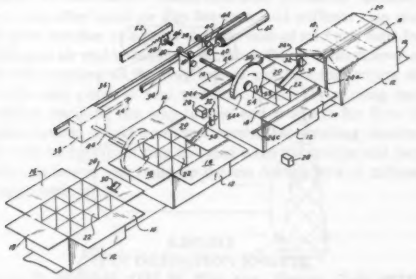
station, a pressure application device including a pressure application band arranged to engage the bag at the input end in the region adjacent the open end thereof for moving the bag in combination with said conveying means through the bag folding zone to the output end of the bag closing station, said pressure application device including driving and deflecting rollers for said pressure application band with one of said rollers located at the input end and the other located at the output end of said bag closing station and with said rollers being rotatable about axes extending generally parallel with the axis of the bag being moved through the bag closing station and transversely of said conveying surface, a folding device located in the bag closing station and positioned adjacent said pressure application band, wherein the improvement comprises that said folding device is at least partially co-extensive in the direction of the axis of the bag moving through the bag closing station with said pressure application band in contact with the bag, a housing for supporting said pressure application band and extending from the input to the output end of the bag closing station, said folding device comprises a bar serving as a curved cam for folding the open end of the filled bag and extending from said input end to said output end of said bag closing station, said bar connected to said housing at the input end and spaced in the axial direction of the filled bag on the opposite side of said rollers from said conveying surface, said bar comprises a first part fixed to and extending obliquely outwardly from said housing toward the output end in generally parallel relation with said conveying surface and extending across the path of the open end of the filled bag entering the input end, a second part extending from the end of said first part spaced from said housing toward the output end in generally parallel relation with both the path of the filled bag traveling from the input end to the output end and said conveying surface, a third part extending from the end of said second part spaced from said first part in generally parallel relation with the path of the filled bag traveling from the input end to the output end and in converging relation with said conveying surface toward the output end, and a fourth part extending from the end of said third part spaced from said second part toward said output end in generally parallel relation with both the path of the filled bag traveling from the input end to the output end and said conveying surface.

4,191,005

CASE OPENING APPARATUS

Adam V. Vinoskey, Forest, Va., assignor to Simplimatic Engineering Company, Lynchburg, Va.

Filed Jan. 4, 1979, Ser. No. 836
Int. Cl.[2] B65B *43/39*
U.S. Cl. 53—382 **19 Claims**



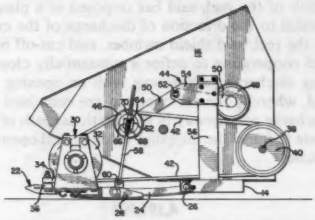
1. Apparatus for opening the leading flap of a case or the like, said apparatus comprising a track, a rack fixedly mounted on said track and comprising a plurality of gear teeth, a carriage mounted on said track for movement with respect thereto, means for moving said carriage along said track, a pinion gear mounted on said carriage in operable engagement with said rack, said gear being rotated as said carriage is moved along said track; flap engaging means and means for operably connecting said flap engaging means to said pinion for rotation therewith, said carriage being movable relative to said track to cause said flap engaging means to be displaced and rotated relative to the case to engage the closed leading flap and to move same from the closed position to an opened position.

4,191,006

FLOATING CUTTERBAR KNIFE DRIVE

Dathan R. Kerber, Bettendorf, Iowa; Orlin W. Johnson, East Moline, Ill., and Robert D. Week, Bloomington, Minn., assignors to International Harvester Company, Chicago, Ill.

Filed May 8, 1978, Ser. No. 904,164
Int. Cl.[2] A01D *69/08*
U.S. Cl. 56—11.6 **5 Claims**



1. A harvesting header for a mobile harvesting machine, comprising:

a header frame having opposite end walls;

a floating cutterbar for cutting a standing crop;

means mounting said cutterbar on said header frame for ground-induced vertical movement relative thereto to accommodate variable ground profile, said means including a fore-and-aft extending runner connected to the cutterbar and pivotally connected to the header frame, said runner being disposed adjacent to one of said side walls;

a drive system for the cutterbar including a wobble drive mounted on said end runner and a belt drive therefor mounted on said one side wall;

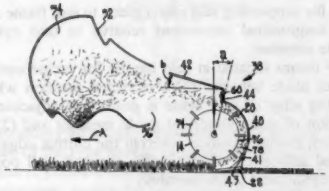
and means defining a positive interconnection between said end runner and said belt drive to provide continuous change in belt drive geometry created by and to compensate for cutterbar movement relative to the header in operation.

4,191,007

REEL MOWER SHIELD ASSEMBLY

Joseph M. Check, Minneapolis, and E. Smith Reed, Jr., Deephaven, both of Minn., assignors to The Toro Company, Minneapolis, Minn.

Filed Jun. 23, 1978, Ser. No. 918,588
Int. Cl.[2] A01D *35/22, 53/06*
U.S. Cl. 56—199 **9 Claims**



1. In a reel-type mower having an elongated cutting reel with a plurality of cutting blades, said reel mounted to a housing for rotation about a substantially horizontal axis, a bed

knife disposed proximate the ground and cooperating with the cutting blades for scissor-like cutting, and a grass clipping catcher spaced apart from the reel and positioned to receive the cut clippings, an improved shield means for directing cut clippings into the catcher, comprising:

(a) a shield member mounted to the housing and encompassing a portion of the circumference of the reel on the opposite side of the reel from the grass catcher, said shield member having a bottom end proximate the bed knife and a top end disposed generally above the reel, said shield member between said bottom and top ends also having an inner surface with a radius of curvature measured from the horizontal rotational axis of the cutting reel greater than the radial distance between the reel rotational axis and the outer edge of the cutting blades;

(b) a cut-off bar mounted to said shield member at said top end thereof and extending inwardly from said inner surface toward the reel and along substantially tne entire width of the reel, said bar disposed in a plane generally normal to the direction of discharge of the cut clippings by the reel, said shield member, said cut-off bar, and said reel cooperating to define a substantially closed cut-clipping discharge passageway with an opening at said top end, whereby the cut clippings are contained within said discharge passageway in the rotational path of the cutting blade to impel the clippings through said opening into the catcher.

4,191,008

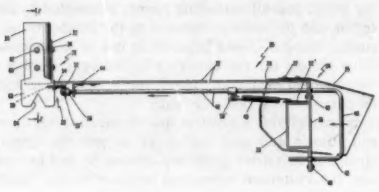
APPARATUS FOR HARVESTING OKRA OR THE LIKE

Archie O. Smith, 10169 Denton Rd., Jacksonville, Fla. 32226

Filed Mar. 10, 1978, Ser. No. 885,164

Int. Cl.[2] A01D *46/00*

U.S. Cl. 56—327 R **13 Claims**



1. A fruit harvesting apparatus, comprising

an elongated frame member, one end of said frame member forming a handle;

a cylindrical guide member for receiving fruit to be harvested, said guide member being attached to the opposite end of said frame member and having an axis perpendicular to said frame member;

a cutter blade positioned adjacent a lower end of said guide member;

means for supporting said cutter blade to said frame member for longitudinal movement relative to said cylindrical guide member;

trigger means located at said handle for reciprocating said cutter blade between (1) a retracted position wherein a cutting edge of said blade is positioned adjacent a wall portion of said cylindrical guide member and (2) an extended, cutting position wherein the cutting edge is positioned adjacent a diametrically opposed wall portion of said cylindrical guide member;

spring means for biasing said cutter blade in the retracted position; and

stabilizing means attached to and extending below said cylindrical guide member, said stabilizing means adapted for contacting a branch beneath a fruit being cut by said cutter blade.

4,191,009

ROPES AND THE LIKE

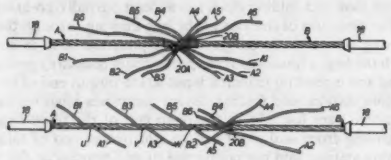
Ian M. Thomson, Wokingham, England, assignor to Cable Belt Limited, England

Filed Nov. 1, 1978, Ser. No. 956,607

Claims priority, application United Kingdom, Nov. 11, 1977, 46953/77

Int. Cl.[2] B65H *69/06*; D02G *3/40*

U.S. Cl. 57—202 **10 Claims**



9. A rope splice, including two rope lengths spliced together, and in which:

each rope length comprises a plurality of strands each covered with an individual sheath of thermoplastic material,

each alternate strand of each rope length being unwound at the splice back to a predetermined point and in its place being wound one of the strands of the other rope length up to the predetermined point,

the predetermined points for each pair of strands being spaced apart along the splice, and

the end regions of the two strands of each pair being placed together at each said point and having their coverings of thermoplastic material bonded together such that the overall diameter of the splice at each said point is not substantially greater than elsewhere along the splice.

4,191,010

PROCESS AND DEVICE FOR PRODUCING FANCY YARN

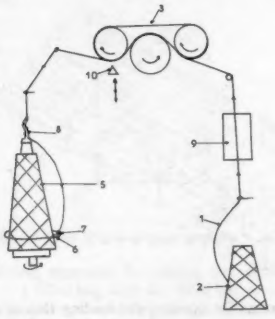
Robert Lehmann, L'Arbresle; André Lyonnet, Lyons, and Paul Rochas, St. Didier au Maur d'Or, all of France, assignors to Institut Textile de France and Agence Nationale de Valorisation de la Recherche, both of Boulogne sur Seine, France

Filed Jun. 29, 1978, Ser. No. 920,501

Claims priority, application France, Jul. 1, 1977, 77 21022

Int. Cl.[2] D02G *1/10, 1/00*

U.S. Cl. 57—208 **22 Claims**



1. A process for the production of a fancy yarn having stable protuberances along its length, wherein at least one multi-filament yarn of continuous filaments which is essentially free

from twist is delivered by means of a positive delivery device and then twisted and taken up by means of a spindle, and wherein, without varying the feed rate and the take-up speed of the yarn, some of the filaments of the multi-filament yarn are temporarily braked by means of an edge acting on the yarn at a position where the yarn is in contact with a surface of the delivery device, the twist imparted by the spindle extending back to the zone in which the edge acts on the yarn.

4,191,011

MOUNT ASSEMBLY FOR POROUS TRANSITION PANEL AT ANNULAR COMBUSTOR OUTLET

Ralph B. Sweeney, and Albert J. Verdouw, both of Indianapolis, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 21, 1977, Ser. No. 862,859
Int. Cl.² F02C 7/12, 7/20
U.S. Cl. 60—39.32 **4 Claims**

1. A gas turbine engine combustor mount assembly comprising an annular combustor outlet transition panel having an outer surface and at least one layer of porous material defining an outlet for exhaust flow from the combustor, said transition panel having an end face therearound and pores extending therethrough up to said end face for directing coolant through transition panel from the outer surface to said end face, a stiffener ring connected to said end face downstream thereof to permit unrestricted flow of coolant from said outer surface to said end face and furthermore to reinforce said transition panel, an annular weld joining said ring to said end face to transmit exhaust heat from the end face to said stiffener ring for dissipation from the combustor, a combustor pilot member located in axially spaced surrounding relationship to said end face, connector means for supporting said stiffener ring on said pilot member in free floating relationship therewith to compensate for both radial and axial thermal expansion of said transition member, said connector means including means for maintaining a controlled axial air gap between said stiffener ring and said pilot member at a point downstream of said end face for defining an air seal to maintain a high pressure coolant level at said outer surface all the way to said end face for forcing air through said pores in said transition panel for cooling said transition panel all the way to said end face and for flow of coolant outside of said transition member into cooling relationship with said stiffener ring and said weld to cool the end face against excessive heat build-up therein during flow of exhaust through said outlet.

4,191,012

WET OXIDATION ENGINE

Xerxes T. Stoddard, 4617 W. 27th Ave., Denver, Colo. 80215; Vesper A. Vaseen, 9840 W. 35th Ave., Wheat Ridge, Colo. 80033, and Ruel C. Terry, 3090 S. High St., Denver, Colo. 80210

Filed Jul. 10, 1978, Ser. No. 923,396
Int. Cl.² F02G 3/00
U.S. Cl. 60—39.05 **10 Claims**

1. A method of coupling a wet oxidation reactor to an engine so that the gaseous products of wet oxidation reactions can be converted into mechanical work, comprising the steps of

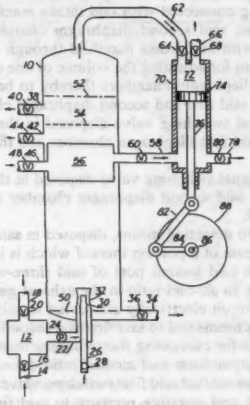
injecting a mixture of fuel and an inert liquid into the reactor,

injecting an oxidizer into the reactor,

establishing superatmospheric pressure within the reactor,

establishing superambient temperature within the reactor,

wet oxidizing the fuel to residue,



withdrawing the gaseous products of wet oxidation reactions from the reactor, and

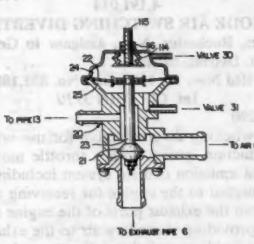
diverting the gaseous products of wet oxidation reactions through an engine with the resultant generation of mechanical work, wherein the said inert liquid is a fluorocarbon with eight or more carbon atoms.

4,191,013

DEVICE FOR PURIFYING EXHAUST GASES FROM INTERNAL COMBUSTION ENGINE

Eturou Katahira; Shunzo Yamaguchi, both of Okazaki; Masashi Kida, Nishio; Yasuhiko Ishida, and Hideo Miyagi, both of Susono, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed May 24, 1977, Ser. No. 800,071
Claims priority, application Japan, Jun. 2, 1976, 51-65063; Jun. 4, 1976, 51-65840; Jun. 25, 1976, 51-84270[U]
Int. Cl.² F01N 3/10
U.S. Cl. 60—276 **2 Claims**



1. A secondary air supply apparatus for an internal combustion engine of the type having an intake manifold for developing a negative pressure during operation of the engine, a combustion chamber, means for supplying an air-fuel mixture to said combustion chamber, an exhaust pipe for conveying exhaust gases to the atmosphere, and reactor means disposed in said exhaust pipe for purifying the exhaust gases, said apparatus comprising:

a source of air;

a three-way valve having a first port connected to said source of air, a second port connected to said exhaust pipe upstream of said reactor means, a third port connected to said source, a valve body for selectively communicating said first port with either of said second and third ports, a diaphragm connected with said valve body, first and second diaphragm chambers formed on opposite sides of said diaphragm, respectively, said first diaphragm chamber being connected with said intake manifold through a first tube, said second diaphragm chamber being connected with said intake manifold through a second tube, and means for adjusting the volume of one of said first and second diaphragm chambers thereby to balance the volumes of said first and second diaphragm chambers;

a first signal switching valve disposed in the first tube between said first diaphragm chamber and the intake manifold;

a second signal switching valve disposed in the second tube between said second diaphragm chamber and the intake manifold;

air-fuel ratio detecting means, disposed in said exhaust pipe downstream of a portion thereof which is in communication with said second port of said three-way valve, for detecting an air-fuel ratio in the exhaust gases; and

a control circuit electrically connected to said air-fuel ratio detecting means and to said first and second signal switching means for energizing the switching means in response to the output from said air-fuel ratio detecting means in such a manner that said first switching valve is switched to introduce said negative pressure to said first diaphragm chamber, while said second switching valve is switched to connect said second diaphragm chamber to the atmosphere, during a first condition wherein said air-fuel ratio detecting means detects a lower ratio than a predetermined value, and that said first switching valve is switched to connect said first diaphragm chamber to the atmosphere, while said second switching valve is switched to introduce said negative pressure to said second diaphragm chamber, in a second condition wherein said air-fuel ratio detecting means detects a higher ratio than said predetermined value, said second port of said three-way valve being connected with said first port to supply secondary air from said source to said exhaust pipe in the first condition, and said first port of said three-way valve being connected with said third port to return said secondary air to the source in said second condition, said switching operation of said three-way valve being performed only in response to differences in pressure occurring between said first and second diaphragm chambers.

4,191,014

POWER MODE AIR SWITCHING DIVERTER VALVE

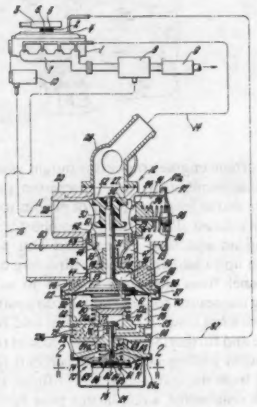
John E. Jones, Rochester, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 14, 1977, Ser. No. 851,180

Int. Cl.[2] F01N *3/10*

U.S. Cl. 60—290 **1 Claim**

1. An air switching diverter valve for use with an engine having an induction system with a throttle movable therein and an exhaust emission control system including an exhaust manifold connected to the engine for receiving exhaust gases discharged from the exhaust ports of the engine and, a driven air pump for providing secondary air to the exhaust emission control system, said air switching diverter valve including a housing having a valve chamber therein, an inlet passage opening into said valve chamber and adapted to be connected to the air pump for receiving secondary air, a primary discharge passage in said housing extending from said valve chamber and adapted to be connected to said exhaust manifold, a secondary discharge passage from said valve chamber and a bypass outlet passage extending from said valve chamber for discharging air to the atmosphere, a one-way pressure relief valve means positioned in said bypass outlet passage to control flow from said valve chamber out through said bypass outlet passage, one end of said primary discharge passage and one end of said secondary discharge passage being axially aligned in spaced apart relation to each other, a metering valve means including a metering valve movably supported in said housing, said valve being positioned in said valve chamber for movement between a first position blocking flow from said valve chamber out through said primary discharge passage and a second position blocking flow from said valve chamber out through said secondary discharge passage, actuator means including a diaphragm operatively connected to one end of said metering valve means opposite said metering valve, said diaphragm forming with a first portion of said housing a pressure chamber open to the atmosphere on one side of said diaphragm and on its other side a metering vacuum chamber, said actuator means further including a spring means positioned in said metering vacuum chamber to be in operative abutment against said diaphragm to normally bias said metering valve toward said first position, fluid passage means in said housing in communication at one end with said metering vacuum chamber and at its other end opening to the atmosphere, a timing valve means operatively positioned in said housing for movement to control

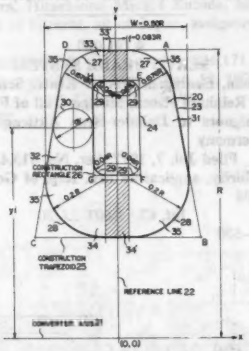


fluid flow through said passage means, said timing valve means including a second actuator means having a second diaphragm with a timing valve means therein forming with a second portion of said housing a vacuum chamber on one side of said second diaphragm and a timing chamber on the opposite side of said second diaphragm, said timing chamber being in fluid communication with said vacuum chamber as controlled by said timing valve means, port means in said housing opening at one end into said vacuum chamber and at its other end being connectable to the engine induction system downstream of the throttle, said timing valve means including a valve and a valve stem, a valve stem guide bore means in said housing opening into said vacuum chamber, said valve stem being guided in said valve stem guide bore means to form therewith a metering control orifice passage means, said fluid passage means including a passage portion in fluid communication with said metering control orifice downstream of said valve in terms of flow from the atmosphere to said metering vacuum chamber through said fluid passage means and, said timing valve means including second spring means normally biasing said second diaphragm in a direction to effect movement of said valve in a direction blocking flow of atmospheric air through said fluid passage means to said metering vacuum chamber.

4,191,015
UNIVERSAL TOROIDAL CIRCUIT FOR HYDRAULIC TORQUE CONVERTERS

Mitsuaki Komatsu, and Akinori Yokoyama, both of Yokohama, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Aug. 7, 1978, Ser. No. 931,430
Claims priority, application Japan, Aug. 12, 1977, 52-96096
Int. Cl.[2] F16D *33/00*
U.S. Cl. 60—361 13 Claims



1. A hydraulic torque converter comprising an impelller member, a turbine member, and a reactor member, each of the impeller, turbine and reactor members including a shell and a core and a plurality of blades bridged therebetween, the shells and cores of the impeller, turbine and reactor members forming at least parts of the outer and inner walls, respectively, of a toroidal circuit in which a working fluid is recirculated, the shape of the circuit in a radial plane of the converter being related by reference to a construction trapezoid and a construction rectangle which are determined by a system of rectangular coordinates with the axis of the converter taken as the X-axis and a line perpendicular thereto as the Y-axis, the construction trapezoid being bounded by lines connecting, in the order given, a series of design points A, B, C and D which are expressed approximately as A(0.1737 R, 1.0000 R), B(0.2883 R, 0.3500 R), C(−0.2883 R, 0.3500 R), and D(−0.1737 R, 1.0000 R), wherein R is the maximum radius of the circuit, the construction rectangle being bounded by lines connecting, in the order given, another series of design points E, F, G and H which are expressed approximately as E(0.0815 R, 0.8945 R), F(0.0815 R, 0.5677 R), G(−0.0815 R, 0.5677 R), and H(−0.0815 R, 0.8945 R), the shape of the outer wall of the circuit being defined by rounding the corners at the design points A and D of the construction trapezoid with arcs having radii of approximately 0.1576 R and by rounding the corners at the design points B and C of the construction trapezoid with arcs having radii of approximately 0.2000 R, the shape of the inner wall of the circuit being defined by rounding all the four corners of the construction rectangle with arcs having radii of approximately 0.0400 R, the outer and inner walls of the circuit being tangent to an infinite number of circles the diameter di of each of which is expressed approximately by the formula:

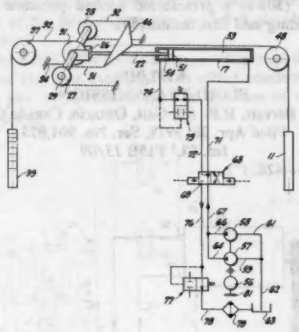
$$di = \frac{0.2\pi R^2}{2\pi yi}$$

wherein yi is the radial distance of the center of each circle from the converter axis.

4,191,016
PUMPING JACK

Albert B. Roth, Lafayette, and Albert Louie, San Leandro, both of Calif., assignors to N L Industries, Inc., Hightstown, N.J.

Filed Jul. 7, 1978, Ser. No. 923,028
Int. Cl.[2] F15B *1/02*
U.S. Cl. 60—371 7 Claims

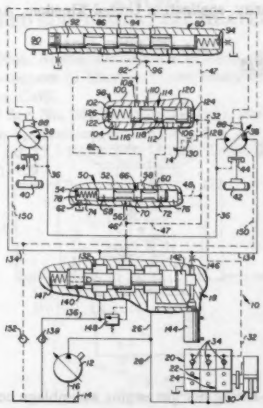


1. A pumping jack for use with a vertically reciprocable polish rod comprising a base, a hydraulic cylinder having an axis, means for mounting said cylinder on said base with said axis horizontal, a plunger in said cylinder and having reciprocation along said axis, a block on said plunger, a first sheave on said block, a well sheave having a periphery, means for mounting said well sheave on said base with said well sheave periphery tangent to said polish rod, a first flexible line reeved around said first sheave and said well sheave, means for affixing one end of said first line to said polish rod, means for affixing the other end of said first line to said base, and hydraulic means for reciprocating said plunger in said cylinder.

4,191,017
MOTOR DISPLACEMENT CONTROL SYSTEM

Joseph E. Dezelan, Western Springs, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 8, 1979, Ser. No. 18,953
Int. Cl.[2] F15B *11/20, 13/06*
U.S. Cl. 60—420 11 Claims



1. In a motor displacement control system (10) of the type having a variable displacement drive motor (38), an auxiliary

motor (30), a source (12) of fluid under pressure for operating the motors (30, 38), the improvement comprising:

first means (50) for controlling the displacement of the drive motor (38) and maintaining at least a preselected first pressure level thereto; and

second means (98) for controlling the displacement of the drive motor (38) in response to operation of the auxiliary motor (30) at a preselected second pressure level and overriding said first means (50).

4,191,018

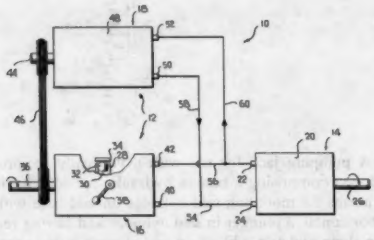
FLUID TRANSMISSION

George M. Barrett, R.R. #5, Galt, Ontario, Canada (N1R 5S6)

Filed Apr. 28, 1978, Ser. No. 901,073

Int. Cl.[2] F15B *13/09*

U.S. Cl. 60—428 9 Claims



1. A hydraulic pump combination for supplying hydraulic fluid under pressure to a hydraulic motor at variable rates and in reversible directions, said pump combination comprising first and second pumps constantly directly connected in parallel in fixed relation to first and second lines for a hydraulic motor, said first pump being a variable volume, variable direction pump, and said second pump being a constant volume, constant direction pump.

4,191,019

DOUBLE-ACTING HOT GAS ENGINE ASSEMBLAGE

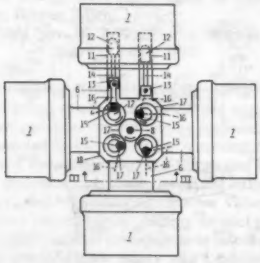
Jan C. Bratt, Malmö; Bengt-Ove M. Moodysson, Åkarp, and Nils K. G. Rosenqvist, Malmö, all of Sweden, assignors to Kommanditbolaget United Stirling (Sweden) AB & Co., Malmö, Sweden

Filed Apr. 14, 1978, Ser. No. 896,590

Claims priority, application United Kingdom, Aug. 26, 1977, 35837/77

Int. Cl.[2] F02G *1/04*

U.S. Cl. 60—525 4 Claims



1. A double-acting hot gas engine assemblage comprising in combination a central common power output shaft; four hot gas engine cylinder-and-piston units disposed symmetrically around the axis of the power output shaft, each unit including a plurality of individual cylinders and associated pistons, said cylinders and associated pistons in each of said units being parallel to each other and arranged in two parallel rows; four crank-shafts with axes parallel to and equidistant from the axis of the power output shaft; piston rods, cross-heads and connecting rods connecting the pistons in said units to said crank-shafts, the axes of said crank-shafts lying substantially on the respective intersections of the planes defined by the axes of the cylinders in adjacent ones of said rows in adjacent ones of said units, each of said crank-shafts being connected to those of said pistons associated with said cylinders defining the respective intersecting planes; and gear wheels connecting the crank-shafts to the power output shaft for interdependent rotation.

4,191,020

SERVO BRAKE SYSTEM

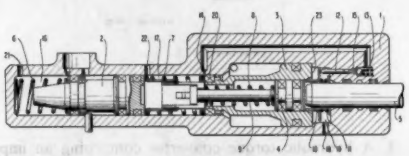
Hellmut Krohn, Esslingen; Werner Kruse, Schorndorf-Schornbach, and Reinhard Resch, Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 7, 1977, Ser. No. 813,431

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1976, 2631604

Int. Cl.[2] B60T *13/20*

U.S. Cl. 60—550 5 Claims



1. An at least two-circuit servo brake installation, the installation including a tandem master cylinder means including housing means, two working piston means arranged substantially coaxially behind one another in the housing means, an input piston means, a servo means operatively connected to the master cylinder means, and a transmission shifting means for automatically shifting to a larger pedal travel with a mechanically applied brake pressure reduced within permissive limits upon a failure of the servo means, characterized in that the two working piston means are hydraulically operatively connected to each other, a first of the working piston means is disposed on an actuating side of the master cylinder means and is provided with an end face adapted to be acted upon by a pressure medium supplied to a first pressure space means, said first working piston means is provided with a bore extending substantially coaxially to the other working piston means, a plunger piston means is guided within said bore and is actuatable by the input piston means, a second pressure space means is provided in the housing means for accommodating a pressure medium, the second pressure space means is disposed so as to be acted upon by the first working piston means, an equalization bore means is provided in the housing means for operatively connecting the second pressure space means with a pressure medium reservoir, said equalization bore means being open during both an unactuated condition of the brake installation and a mechanical actuation of the brake installation upon a failure of the servo means, said first working piston means being cooperable with a first end of said equalization bore means so as to close the same during a servo assisted actuation of the brake installation, means are provided for closing a second end of said equalization bore means with an actuation of the brake installation upon a failure of the servo means including a valve closure member, and means for positioning said valve closure member so as to open or close the second end of the equalization bore means in response to a predetermined condition of the brake installation, said positioning means including a spring means acting upon the valve closure member, a sleeve means operatively connected to the plunger piston means so as to be

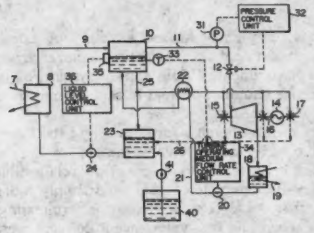
displaceable therewith, and a displaceably mounted plunger arranged in the first pressure space means and cooperable with said sleeve means so as to maintain the valve closure member in an open position in an unactuated condition of the brake installation and in a closed position in an actuated condition of the brake installation, and in that means are provided for connecting the plunger piston means to said first working piston means.

4,191,021

SMALL POWER PLANT UTILIZING WASTE HEAT

Shozo Nakamura, Hitachiota; Michio Kuroda, and Ryoichiro Oshima, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 15, 1977, Ser. No. 816,171
Claims priority, application Japan, Aug. 11, 1976, 51-94806
Int. Cl.[2] F01K *25/10*
U.S. Cl. 60—657 **4 Claims**



1. A small power plant utilizing waste heat characterized in that

said plant comprises: an intermediate heat transfer medium heater for transferring heat from a heat source to an intermediate heat transfer medium; a direct contact heat exchanger for transferring heat from said intermediate heat transfer medium to a turbine operating medium; and a turbine generating plant driven by said turbine operating medium;

a material being capable of lubricating bearings, thermally stable and not chemically reactive with said turbine operating medium being used as said intermediate heat transfer medium; and

a material taking heat off said intermediate heat transfer medium in said direct contact heat exchanger and being changeable in phase from a liquefied turbine operating medium to a gaseous turbine operating medium being used as said turbine operating medium, wherein at least a part of the intermediate heat transfer medium from said direct contact heat exchanger is supplied to said intermediate heat transfer medium heater through an intermediate heat transfer medium tank and wherein an intermediate heat transfer medium pump is interposed between said intermediate heat transfer medium heater and said tank, and said pump is controlled based on the liquid level of the intermediate heat transfer in said direct contact heat exchanger.

4,191,022

CHEMICAL PLANT

John A. Williams, Warrington, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Apr. 3, 1978, Ser. No. 892,968
Int. Cl.[2] F25B *39/00*; B01D *59/08*
U.S. Cl. 62—55.5 **18 Claims**

1. A plant in which the atmosphere is contained and continuously circulated in a closed circuit, circulation of the atmosphere being effected by the driving force obtained from the alternate condensation and evaporation of at least part of the atmosphere circulating in the plant, the plant comprising:

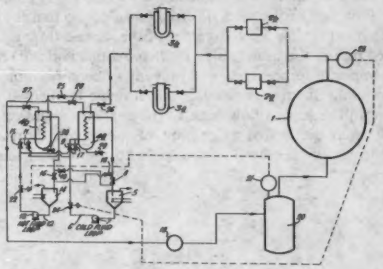
a first heat exchanger,

a second heat exchanger connected in parallel with the first heat exchanger,

first valve means for directing the atmosphere circulating in the plant into one of the heat exchangers,

second valve means for directing the atmosphere leaving the other of the heat exchangers so that it circulates around the plant.

first circulating means for passing a refrigerant through said one of the heat exchangers to effect condensation of at least part of the atmosphere in said one of the heat exchangers,



second circulating means for passing a liquid at a temperature above the evaporation temperature of the condensed atmosphere through said other heat exchanger to effect evaporation of condensed atmosphere in said other heat exchanger, and

switching means for operating the first and second valve means to alternately direct the atmosphere circulating around the plant into the heat exchangers said switching means also operating the first and second circulating means to direct the refrigerant so that is passes through the heat exchanger in which condensation is occurring and to direct the liquid to the heat exchanger in which evaporation of condensed atmosphere is occurring,

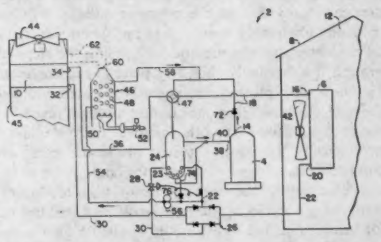
the heat exchangers being used alternately for condensation and evaporation to provide a continuous driving force to effect circulation of the atmosphere around the plant.

4,191,023

FUEL FIRED SUPPLEMENTARY HEATER FOR HEAT PUMP

Francis J. Sisk, Apollo, and Stephen E. Veyo, Murrysville, both of Pa., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Division of Ser. No. 769,830, Feb. 18, 1977, Pat. No. 4,112,705. This application Jun. 23, 1978, Ser. No. 918,736
Int. Cl.[2] F25B *7/00, 27/02, 13/00, 29/00*
U.S. Cl. 62—79 **4 Claims**



1. A method for supplying a heat pump with additional,

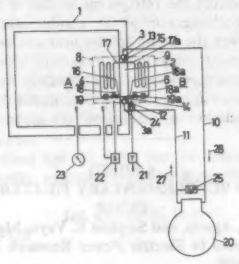
auxiliary heat during operation of the pump for heating an indoor space while the outdoor temperature is too low to heat the space to the desired temperature, the heat pump including a compressor, an indoor condenser, an outdoor evaporator, and piping for flowing a refrigerant between the compressor, the condenser, and the evaporator, the method comprising the steps of: operating the compressor to flow high pressure, high temperature refrigerant vapor to the condenser; condensing the high pressure, high temperature vapor in the condensor to form liquid refrigerant; forming a first refrigerant flow by circulating the liquid refrigerant to the evaporator and hence circulating evaporated refrigerant back to the compressor; forming a second refrigerant flow bypassing the compressor by taking a portion of the liquid refrigerant from the condensor, heating the liquid refrigerant in the second flow, controlling the flow rate of the second refrigerant flow so that it exceeds the rate at which the refrigerant of the second flow is evaporated during the heating step to thereby maintain the refrigerant vapor in its wet state and prevent a decomposition of the refrigerant due to overheating, and flowing the heated refrigerant of the second flow back to the condenser; and releasing heat from the heated refrigerant of the second flow in the condenser to thereby heat the space to the desired temperature.

4,191,024

DEFROSTING METHOD AND COOLING APPARATUS IN A REFRIGERATION SYSTEM

Keisuke Machida, 123, Oaza Hagishima Oyama City, Tochige Pref., Japan

Filed Apr. 28, 1978, Ser. No. 901,260
Int. Cl.[2] F25D *21/00, 21/06, 19/00, 17/04*
U.S. Cl. 62—80 **7 Claims**



1. In a refrigeration system for preserving foods and others in an enclosure, a method of removing frost or ice accumulated during the refrigeration cycle on cooling means which are symmetrically provided on the opposite sides of a thermally shielding plate rotatably mounted in an opening in one side wall of the enclosure, the method comprising the steps of:

operating the thermally shielding plate at regular intervals for alternately placing cooling means inside and outside the enclosure such that one cooling means is placed inside the enclosure while the other is placed outside; and

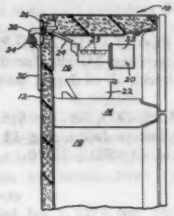
actuating only the cooling means inside the enclosure to commence its refrigeration cycle for cooling the air inside, and deactuating the cooling means outside during the refrigeration cycle of the first-mentioned cooling means for being subjected to externally applied higher temperature and having the accumulated frost or ice removed by melting.

4,191,025

FLUID SUPPLY SYSTEM FOR A DOMESTIC APPLIANCE

William M. Webb, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jul. 3, 1978, Ser. No. 921,427
Int. Cl.[2] F25C *1/00*
U.S. Cl. 62—135 **12 Claims**



10. In a refrigerator having a fresh food compartment, a freezer compartment, an automatic ice maker arranged in said freezer compartment, a fluid supply system for delivering a predetermined amount of fluid to said ice maker, including,

a first valve means;

control means operable for controlling the amount of fluid delivered by said first valve means;

a second valve arranged in series flow relationship with said first valve operable by said fluid supply independent of said first valve control means for terminating said fluid flow when said first valve means delivers more than said predetermined amount of fluid;

said second valve including a casing having a cylindrical wall and a transverse wall integrally joined to define a generally cup-shaped configuration with the open end providing an inlet and a substantially centrally arranged outlet in said transverse wall;

a valve member responsive to said fluid flow arranged in said casing having,

(a) a central member including a port,

(b) upstream and downstream bellows section having their opposite end portions respectively in sealed connection with the opposite faces of the central member so that said central member including said port is within the bellows section,

(c) liquid within the opposite bellows sections movable through said port from one bellows section to the other,

(d) a valve portion arranged on said lower bellows section arranged in cooperating relationship with said outlet;

means providing a passageway bypassing said valve member for allowing fluid flow between said inlet and outlet;

said passageway being dimensioned to provide a pressure differential between said inlet and outlet to allow said fluid supply to move said upper bellows section toward said central member to force said liquid through the port into the lower bellows section at a preselected rate thereby moving said valve portion into engagement with said outlet to stop the flow of fluid in said supply system after passing a predetermined quantity of fluid.

4,191,026

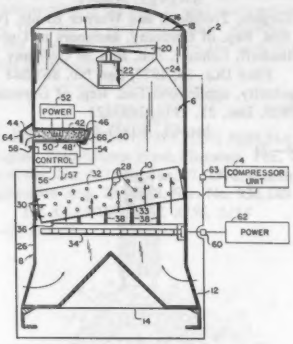
APPARATUS FOR DEFROSTING LOW TEMPERATURE HEAT EXCHANGER

Francis J. Sisk, Apollo, Pa., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Feb. 14, 1977, Ser. No. 768,451
Int. Cl.[2] F25D *21/02*
U.S. Cl. 62—140 **15 Claims**

1. A heat exchanger defrosting system comprising in combination: a heat exchanger; an air duct surrounding the heat exchanger for flowing air through the duct past the exchanger;

means in fluid communication with a portion of the duct downstream of the heat exchanger for inducing the airflow through the duct and past the exchanger; a relatively small cross-section conduit having an intake disposed outside the downstream duct portion and an outlet disposed inside the downstream duct portion; whereby the flow inducing means also induces the flow of an air current in the conduit; a constant energy output heater for heating the air current; a first temperature sensor disposed within the conduit between the heater and the downstream portion of the duct for sensing the temperature of



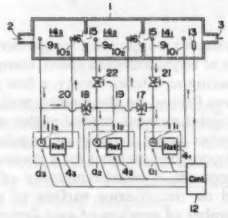
the heated air current; and initiator means responsive to the temperature sensor for initiating a defrost cycle for the heat exchanger in response to a predetermined decrease in the temperature of the heated air current; whereby a reduction in the airflow past the exchanger causes the airflow inducing means to increase the amount of air flowing through the conduit and thereby causes a corresponding reduction in the air current temperature and the initiation of the defrost cycle in response to a predetermined frost buildup on the heat exchanger.

4,191,027

APPARATUS FOR COOLING BRINE

Wahei Inoue, Tokyo, Japan, assignor to Kabushiki Kaisah Maekawa Seisakusho, Tokyo, Japan

Filed Jul. 27, 1977, Ser. No. 819,267
Claims priority, application Japan, Jul. 29, 1976, 51-90509; Oct. 4, 1976, 51-119120; Dec. 23, 1976, 51-155216
Int. Cl.[2] F25D *17/02*
U.S. Cl. 62—185 **3 Claims**



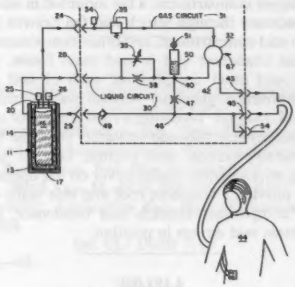
1. An apparatus for cooling brine comprising a slow-current tank for brine having an inlet and an outlet between which brine flows in a slow current, a plurality of independently operable refrigerating units for cooling successive portions of brine from said tank, each unit having an evaporator located remote from said tank and having a suction pipe and a discharge pipe connected to the brine in said tank, temperature detecting means for detecting the temperature of brine in said tank near said outlet of said tank, and a controller responsive to said temperature-detecting means for controlling the operation of said plurality of refrigerating units to increase or decrease the number of said refrigerating units in operation and taking part in the cooling work in accordance with the temperature of brine to maintain said brine at a constant predetermined temperature.

4,191,028

DRY ICE, LIQUID PULSE PUMP COOLING SYSTEM

Norman F. Audet, Southboro, and George M. Orner, Cochituate, both of Mass., assignors to United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 22, 1978, Ser. No. 918,203
Int. Cl.[2] A25D *23/12*; A62B *7/00*
U.S. Cl. 62—259 **15 Claims**



1. A garment cooling system for cooling personnel such as when subject to heat stress comprising:

means combining a receptacle for refrigerant material and a liquid heat exchanger to provide the heat sink and motive power of said system;

a gas operated pump coupled to said receptacle and a liquid cooled garment coupled jointly to said pump and said heat exchanger to form a liquid circuit for continuously supplying heat exchange liquid to said garment,

said liquid circuit including means for limiting flow to one direction therein and fixed and variable flow control means in said circuit for permitting a minimum unidirectional flow therein and additional flow respective to demand from the wearer;

a liquid accumulator connected to said circuit for maintaining liquid under selected pressure therein;

pressure release means connected to said receptacle for limiting the pressure therein and vent means connected to said accumulator for adjusting the pressure in said circuit; and

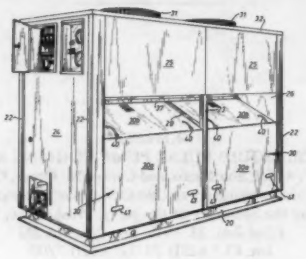
a sublimating refrigerant material in said receptacle and liquid heat transfer material in said heat exchanger and said circuit,

whereby gas sublimating from said refrigerant material will operate said pump and said pump will circulate heat transfer material in said circuit thereby supplying a cooling medium for dissipating a selected amount of excess heat emanating from the wearer of said garment.

4,191,029
WATER CHILLERS AND AIR COOLED REFRIGERATION UNITS

William A. Dunne, 164 West Way, Bournemouth, Dorset, England (BH9 3DY)

Filed Jun. 12, 1978, Ser. No. 914,429
Claims priority, application United Kingdom, Jun. 21, 1977, 25872/77
Int. Cl.[2] F25D 17/06
U.S. Cl. 62—428 8 Claims

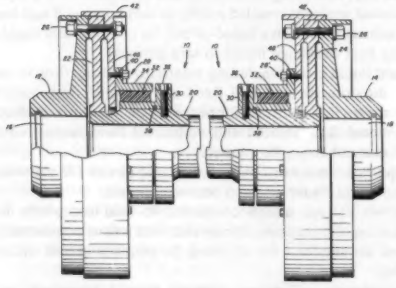


1. A chiller unit comprising means defining a main frame having an upper compartment, a fan mounted in said compartment, a condenser through which said fan drawns cooling air mounted in said compartment, and other components mounted beneath said condenser and in said main frame, removable covers for said other components, each of said removable covers comprising a generally vertical wall portion of sheet material, and, integral therewith, a roof portion of sheet material which slopes inwardly and upwardly from the upper edge of said generally vertical wall portion, each of said covers cooperating with another similar cover on the opposite side of the unit to provide a complete roof and side walls to enclose said other components beneath said condenser, and fixing means to retain said covers in position.

4,191,030
DIAPHRAGM COUPLING

Michael M. Calistrat, Sykesville, Md., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Aug. 21, 1978, Ser. No. 935,581
Int. Cl.[2] F16D 3/78
U.S. Cl. 64—13 3 Claims

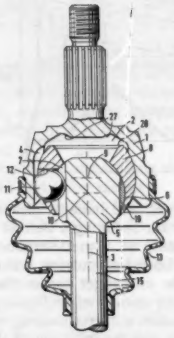


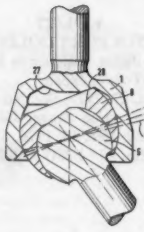
1. An improved metal diaphragm assembly for connecting a pair of axially spaced shaft mounted coupling hubs, the assembly including a pair of axially spaced flexible metal diaphragms, adjacent the hubs, said diaphragms being fixed to a floating shaft, and pilot ring means fixed to said diaphragms and said hubs, the improvement comprising:
a pilot and damper means including:
(i) first ring means fixed to said floating shaft,
(ii) second ring means fixed to said first ring means, said second ring means adapted to absorb vibrations of said assembly; and
(iii) third ring means fixed to said second ring means, said third ring means being operably connected to said pilot ring means.

4,191,031
SWIVEL JOINT

Sobhy L. Girguis, Troisdorf, and Werner Krude, Neunkirchen, both of Fed. Rep. of Germany, assignors to Uni-Cardan Aktiengesellschaft, Lohmar, Fed. Rep. of Germany

Filed Dec. 16, 1977, Ser. No. 861,563
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1976, 2657820; Dec. 21, 1976, 2657821
Int. Cl.[2] F16D 3/30
U.S. Cl. 64—21 10 Claims





1. A swivel joint for transmitting torque between drive and driven members at a synchronized speed, comprising an outer joint member having an interior cavity, a first plurality of ball receiving grooves formed on the interior wall surface of said cavity, an inner joint member carried within said cavity, said inner joint member being capable of angular displacement relative to said outer joint member for a maximum permissible angle of displacement, a second plurality of ball receiving grooves formed on the exterior surface of said inner joint member, the number of grooves of said first plurality of ball receiving grooves corresponding to the number of grooves of the second plurality of ball receiving grooves, a ball carried between at least one pair of corresponding ball receiving grooves of said first and second plurality of grooves for transmitting torque between said inner and outer joint members, said ball in at least one pair of said grooves being subjected to a force caused by play when a diameter of said ball passes through a plane containing the axis of rotation of both said inner joint member and said outer joint member, a cage arranged between said inner and outer joint members, said cage

having window recesses, said ball being retained in one of said window recesses, a stop face located on the inside of said outer joint member, and a cooperating bearing surface carried on said cage for engaging said stop face when said inner joint member is angularly displaced relative to said joint member for an angle smaller than the maximum permissible angle of displacement so that further angular displacement of said inner joint member relative to said outer joint member forces said ball out to its homokinetic plane in a direction causing an increase in the angle between a plane through the center of said ball and the intersection of the axes of said inner and outer joint members and the axis of said inner joint member which is greater than the bisecting angle between the axes of said inner and outer joint members.

4,191,032

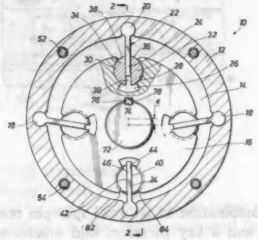
ROTARY ENERGY-TRANSMITTING MECHANISM

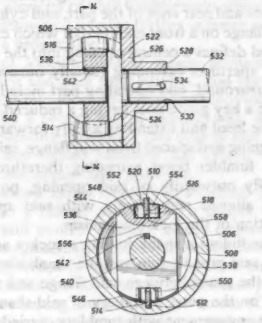
Daniel A. August, 7162 Crown West, Houston, Tex. 77072

Continuation of Ser. No. 872,964, Jan. 27, 1978, abandoned. This application Aug. 23, 1978, Ser. No. 936,148

Int. Cl.[2] F16D *3/52, 3/56, 3/14*

U.S. Cl. 64—27 B **2 Claims**





1. A rotary oscillatable energy-transmitting mechanism in the form of a universal coupling, and comprising:

a housing structure defining an outer force-transmitting element and being formed to define an inner surface of at least partially spherical configuration defining a shaft opening and an internal receptacle;

an inner force-transmitting element being located within said housing and being movable relative to said housing, said inner force-transmitting element being formed to define opposed, at least partially spherical external surfaces for mating engagement within said partially spherical inner surface;

an energy-transmitting shaft being connected to one of said inner and outer force-transmitting elements;

a plurality of bearing pad receptacles being defined by one of said inner and outer force-transmitting elements, said bearing pad receptacles defining internal generally cylindrical surface means and being positioned in opposed relation;

a pair of bearing pads being received by each of said bearing pad receptacles, said bearing pads having generally cylindrical external surfaces having mating engagement with the generally cylindrical surface means defining said receptacles, said bearing pads also being formed to define opposed generally planar bearing surfaces;

a plurality of rigid energy transfer vane elements being located in opposed relation and being immovably related to one of said inner and outer force-transmitting elements, said vane elements being interposed between said bearing surfaces and being in bearing engagement with at least one of said bearing surfaces;

said bearing pads and vane elements sliding one relative to the other upon oscillation of said inner force-transmitting element;

an input shaft being non-rotatably connected to one of said housing structures and said inner force-transmitting element and an output shaft being non-rotatably connected to the other of said housing structure and said inner force-transmitting element; and

one of said input and output shafts extending through said shaft opening and being of substantially smaller dimension than the dimension of said shaft opening to allow substantial axial misalignment between said input and output shafts.

4,191,033

ROCKER ARM CONSTRUCTION FOR KNITTING MACHINE NEEDLE

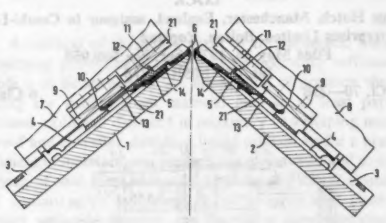
Werner Sommer, Westhausen, Fed. Rep. of Germany, assignor to Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co. KG, Westhausen, Fed. Rep. of Germany

Filed Aug. 31, 1978, Ser. No. 938,573

Claims priority, application Fed. Rep. of Germany, Jan. 3, 1978, 2800186

Int. Cl.[2] D04B *7/04*

U.S. Cl. 66—64 **13 Claims**



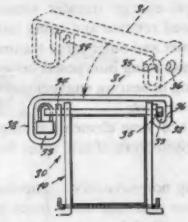
1. A needle arrangement for machines for the manufacture of meshed fabric, including a needle shank provided with a needle hook, a rocker arm pivotably supported on the needle shank beyond a thread zone and controllable to open and close the needle hook, a spring element for biasing the rocker arm towards a position whereat the needle hook is open, and a projection on a first lever arm of the rocker arm remote from the needle hook for implementing the closing of the needle hook by means of a control element, characterized by: the projection on the first lever arm comprising a foot operated by a first lock element movable along a needle bed, a further foot on a second lever arm of the rocker arm proximate the needle hook for implementing the opening of the needle hook by means of a second lock element movable along the needle bed, and the rocker arm being constructed as wide as the needle shank and being held against lateral movement by side walls of a needle receiving channel.

4,191,034

BATTERY LOCK

Jacob Froess c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed Oct. 31, 1977, Ser. No. 846,808
Int. Cl.[2] B60R 18/02
U.S. Cl. 70—258 1 Claim



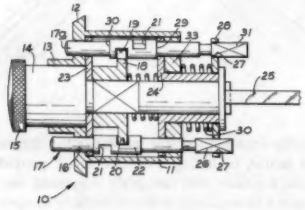
1. A battery lock comprising, in combination, a pair of vertical bars positioned adjacent opposite sides of the battery, the lower ends of said bars each having a hook adapted to be fitted into a slot in a bottom of a supporting tray for the battery, each said bar further including a transverse opening near the upper end thereof, said lock also including a crossbolt having an enlarged head at one end and a hole at the other end, wherein said crossbolt is received in said transverse openings of said bars spaced from and disposed across the top of the battery with said other end of said crossbolt extending beyond one of said bars with a padlock mounted through said hole, said lock also including a removable cover plate having a straight portion covering said bars, crossbolt and padlock, said coverplate including downwardly bent terminal portions removably secured to said crossbolt, said terminal portions encompassing both ends of said crossbolt and said padlock such that said cover plate obstructs access to said cross bolt and padlock.

4,191,035

LOCK

George Hatch, Manchester, England, assignor to Combi-Lock Enterprises Limited, Bolton, England

Filed May 24, 1978, Ser. No. 909,058
Int. Cl.[2] E05B 37/16
U.S. Cl. 70—298 6 Claims



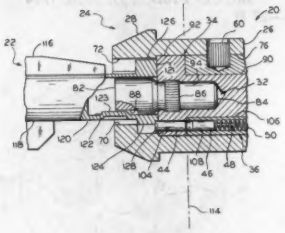
1. A combination lock comprising:
a barrel **11**,
a plunger **14** rotatable and axially movable relative to the barrel,
a plurality of axially-displaceable pins **17** mounted relative to the barrel and circumscribing the plunger and each having a centrally enlarged portion defining inner and outer shoulders at respective ends,
a rotative ward disc **18** carried by the plunger,
an operator-selected number of the pins each having a slot **19** in its respective enlarged portion and alignable with the ward disc when the pins are displaced inwardly and the remaining non-operator selected number of the pins each having a slot **20** in its respective enlarged portion and alignable with the ward disc when the pins are not displaced inwardly,
inner and outer setting plates **24, 23** carried by the plunger for engaging the inner and outer shoulders of the pins respectively,
with the ward disc cooperating with the pins to allow rotary movement of the plunger only when the selected pins are axially displaced relative to the non-selected pins.

4,191,036

AXIAL SPLIT-PIN TUMBLER-TYPE LOCK MECHANISM AND KEY THEREFOR

Robert L. Steinbach, Chicago, Ill., assignor to Chicago Lock Co., Chicago, Ill.

Filed Jan. 16, 1978, Ser. No. 869,851
Int. Cl.[2] E05B 27/08
U.S. Cl. 70—363 1 Claim



1. In a combination of an axial split-pin tumbler-type lock mechanism and a key therefor, said mechanism including a lock cylinder, and an operating part disposed forwardly within said cylinder and rotatable about a longitudinal axis extending between front and rear ends of the part, said cylinder including an annular flange on a front end thereof which extends radially inwardly and defines a central opening into the cylinder and a plurality of apertures extending radially outwardly from the opening therearound, said operating part including a cylindrical head and a key guide post having a reduced diameter with respect to the head and extending axially forwardly therefrom into said opening and spaced from said flange, said head having longitudinal tumbler bores extending therethrough and disposed radially outwardly of said opening, portions of said bores being aligned respectively with said apertures in an initial condition of the lock mechanism;
said key including a shank having a socket adapted for receiving said post therein and the shank also being insertable in the space between said flange and said post, and bittings on the outer periphery of said shank adapted for endwise engagement with tumblers carried by said bores to free the operating part for rotation;
the improvement which comprises means providing a longitudinal blind drive groove in said post and facing one of said tumbler bores substantially in a longitudinal plane therewith, said groove having a maximum depth of 0.030 inch,
a drive lug on said shank extending radially inwardly from the wall of said socket and substantially in a longitudinal plane with one of said bittings and adjacent thereto, said lug being adapted to be received in said groove for interengaging the key and the operating part to cause the latter to rotate when the key is turned, said one bitting being adapted to engage a tumbler carried by said one bore,
said groove depth being such that upon inserting the lug of a picking tool in the groove and attempting to apply lock-picking torque to said post by engagement with the lug during operation of the tool, the tool will tend to slip

owing to a tendency of its lug to slip out of the groove, and

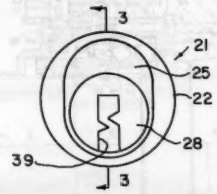
a plurality of tangs extending radially outwardly from the outer periphery of said shank, said tangs being equal in number to the number of said bittings and each being provided with one of said bittings, said tangs being insertable respectively through said apertures and internally of said cylinder beyond said flange in engagement with said tumblers when said bore portions are in said alignment, and the inserted tangs turning behind said flange as the key is turned.

4,191,037

CYLINDER LOCK WITH KEY RESPONSIVE REMOVABLE CORE

George P. Patriquin, Gardner, Mass., assignor to Hudson Lock, Inc., Hudson, Mass.

Filed May 1, 1978, Ser. No. 901,445
Int. Cl.² E05B *27/00*
U.S. Cl. 70—369 **19 Claims**



1. A cylinder lock comprising:

a housing defining a shell cavity;

a shell received by and longitudinally movable in said shell cavity and defining a plug cavity, said shell further defining a plurality of shell tumblerways;

a plug received by and rotatable in said plug cavity and defining a plurality of plug tumblerways aligned with said shell tumblerways, said plug further defining a keyway for receiving a proper key;

a plurality of locking tumbler means positioned in said aligned shell and plug tumblerways, said tumbler means being biased into locked positions and movable into open positions by a proper key in said keyway, said tumbler means preventing rotation of said plug in said plug cavity when in said locked positions and permitting rotation thereof when in said open positions;

a control tumbler means biased into a latched position and forced into a release position by a proper key in said keyway, said control tumbler means disposed so as to obstruct longitudinal withdrawal of said shell from said shell cavity when in said latched position and to permit said movement thereof when in said release position; and

means for preventing longitudinal movement of said plug in said plug cavity and permitting rotational movement thereof.

4,191,038

KEY HOLDER

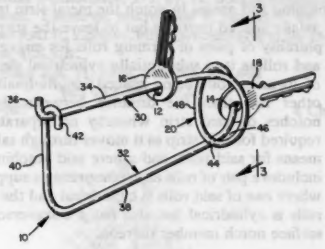
Randy L. Vaughn, 1072 Ivory Rd., Salem, Oreg. 97302

Filed Sep. 15, 1978, Ser. No. 942,640
Int. Cl.² A47G *29/10*
U.S. Cl. 70—457 **10 Claims**

1. A key holder comprising an elongate, resilient member adapted to receive a plurality of keys thereon, which keys have respective member receiving apertures in their heads spaced from the peripheries of the heads a predetermined minimum distance and a predetermined maximum distance;

said member being configured to provide an intermediate portion which is coiled so as to have adjacent sections;

said adjacent sections being spaced apart a distance less than said minimum distance at a point and diverging from each other from said point so that they are spaced apart a distance greater than said maximum distance over a majority of their lengths;



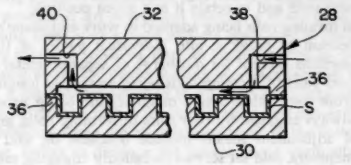
whereby a single one of said plurality of keys can be isolated on a segment of said intermediate portion, sliding of said one key from said segment is substantially inhibited without manual aid, and said one key can slide relatively freely on said sections over a majority of their lengths.

4,191,039

SHEET SHAPING METHOD

Christopher G. Bradbury, Rumford, R.I., assignor to Leesona Corporation, Warwick, R.I.

Filed Jan. 18, 1978, Ser. No. 870,925
Int. Cl.² B21D *22/22*; B29C *17/04*; C03B *23/02*
U.S. Cl. 72—60 **5 Claims**



1. A method of shaping a sheet of thermoplastic material, comprising providing a sheet at a temperature sufficient to enable it to be shaped by the application of pressure thereto, placing the heated sheet material into an at least partially enclosed mold and disposed in proximity to a shaping member thereof and therafter directing liquid coolant under a pressure sufficient to maintain said coolant in a liquid state and to enable shaping of said sheet into said mold by the direct contact of said coolant with said sheet so as to force said sheet into contact with said member and thereafter depressurizing said mold so as to permit the vaporizing of at least a part of the same said coolant contacting said sheet material, thus quickly removing heat from the surface thereof by means of the heat of vaporization effect so as to form at least a solidified skin of cooled material on said sheet material surface opposite to that surface contacting said mold member and thereafter removing said sheet from said mold.

4,191,040

FERRULE ROLLING MACHINE

Herbert F. Dewey, 5110 Brookpark Rd., Cleveland, Ohio 44134

Filed Nov. 7, 1977, Ser. No. 848,830
Int. Cl.² B21D *5/12*
U.S. Cl. 72—132 **1 Claim**

1. Apparatus for forming metal ferrules from a sheet metal strip comprising

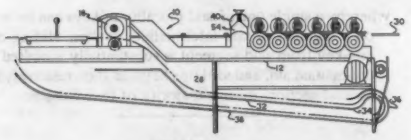
edge guide means for a continuous sheet metal strip to feed it on a desired edge axis,

a pair of trim rolls to cut the metal strip to a desired width strip and to a residual edge section,

guide means engaging said edge section and guiding it through a controlled path to return it to said edge guide means,

notching roll means to notch the metal strip transversely at axially spaced portions but to leave the strip continuous,

a plurality of pairs of forming rolls for engaging said strip and rolling it to substantially cylindrical shape, said pairs of forming rolls being spaced longitudinally from each other less than the distance between the transverse notches on said strip whereby no separate guides are required for said strip as it moves through said rolls, drive means for said rolls, and where said notching roll means includes a pair of rolls each comprising a support shaft and where one of said rolls is cylindrical and the other of said rolls is cylindrical but also has a transversely extending surface notch member thereon,



a pair of support members for one of said rolls fixedly secured to support means for the other of said shafts and extending upwardly therefrom, and

adjustment means comprising a pair of set screws threadedly mounted on said support members to position the two ends of the support shaft for said one roll to adjust it vertically in relation to the support shaft for said other of said rolls and to retain it in a given position;

said forming rolls being adapted to work and shape said edge section to break it into individual pieces at the notch portions thereof for discharge of separate metal ferrules, said pairs of forming rolls being so spaced longitudinally from each other that a metal ferrule being processed is always engaged by two pairs of forming rolls, and

said adjustment means include brackets on said support members, said set screws threadedly engaging said brackets and extending therethrough to engage and extend unthreadedly through said one roll support shaft, and locking ring means securing said one roll support shaft to said set screws.

4,191,041

ROLLING MILLS

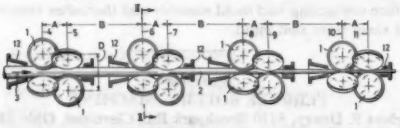
Hans Brauer, Leichlingen, and Werner Demny, Dusseldorf, both of Fed. Rep. of Germany, assignors to Friedrich Kocks GMBH & Company, Dusseldorf, Fed. Rep. of Germany

Filed Jun. 20, 1978, Ser. No. 917,191

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1977, 2741962

Int. Cl.[2] B21B *1/18*

U.S. Cl. 72—235 **7 Claims**



1. A rolling mill for rolling wire or rod-shaped product without the use of guide elements abutting the work material to prevent rotation of the work material about its longitudinal axis between roll stands comprising a plurality of groups of stands which are arranged one after the other and each of which stands has at least three driven rollers, the distance between at least two adjoining stands forming a group is not substantially greater than the roller diameter of those stands and the last sizing pass of each such group of stands has a regular cross-sectional shape in relation to the first sizing pass of the next following group.

4,191,042

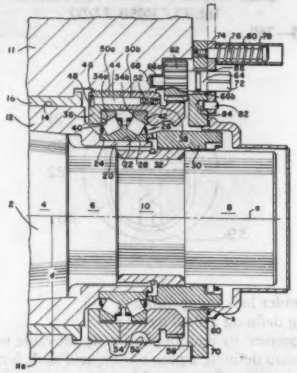
HEAVY DUTY AXIAL ADJUSTMENT MECHANISM FOR ROLLING MILL ROLLS

Lowell S. Salter, Jr., Shrewsbury, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Filed Aug. 3, 1978, Ser. No. 930,748

Int. Cl.[2] B21B *31/18*

U.S. Cl. 72—247 **5 Claims**



1. In a bearing assembly for a rolling mill roll neck, wherein axial adjustments are imparted to the roll relative to the bearing chock via a rolling element thrust bearing having its inner race axially fixed in relation to the roll neck, apparatus cooperatively associated with the outer thrust bearing race for axially adjusting the roll in relation to the bearing chock, comprising: retainer means for axially confining said outer thrust bearing race, said retainer means consisting of two separable components interconnected by fastening means received in aligned openings in said components, said separable components each having external threads in engagement with internal threads on the bearing chock, and operating means associated with at least one of said components for imparting rotation thereto.

4,191,043

METAL DUCT DRIVE BENDING TOOL

Ezra Schaffer, Scottsdale, Ariz.

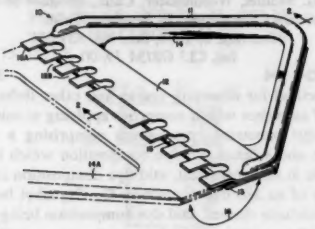
Filed Jul. 21, 1978, Ser. No. 926,659

Int. Cl.[2] B21D *11/20*

U.S. Cl. 72—319 **8 Claims**

1. A metal duct edge bending tool comprising, in combination, a first member having means for holding an edge portion of a metal duct, said holding means comprising a pocket portion located at one edge portion of said first member, a second member having means located at an edge portion of said second member adjacent said one edge portion of said first member for support against the metal duct held by the holding means of said first member while one of said members bend said held portion more than 90°, and pivoting means for permitting at least one of said first and second members to be

pivoted to form a more than 90° bend on the edge portion of the metal duct held by the holding means of said first member,



said supporting means of said second member comprising a plurality of spaced apart teeth elements.

4,191,044

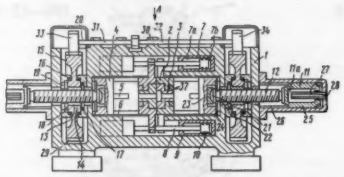
HYDRAULIC SCREW PRESS

Anatoly S. Grigorenko, ulitsa Tovstukho, 1, kv. 2; Jury A. Moroz, ulitsa Fugenfirova, 3, kv. 91; Leonid I. Kortusov, prospekt Mira, 57a, kv. 10, all of Omsk; Jury A. Bocharov, 15 Parkovaya ulitsa, 18, korpus 1, kv. 109, and Anatoly V. Safonov, Sevastopolsky prospekt, 51, korpus 1, kv. 11, both of Moscow, all of U.S.S.R.

Filed Jul. 27, 1978, Ser. No. 928,388

Int. Cl.² B21J *1/18*

U.S. Cl. 72—354 **3 Claims**



1. A hydraulic screw press featuring double-ended pressing action upon the blank, comprising: a frame; female die halves; slides carrying said female die halves, said slides being reciprocatingly mounted on said frame; male dies; slides carrying said male dies, said slides being mounted on said frame so as to reciprocate against said slides carrying said female die halves; a traversing synchronization mechanism interconnecting said slides carrying said male dies; flywheels pivotally mounted on said frame and interconnected through a mechanical gearing; hydraulic power cylinders of said traversing actuator of said slides carrying said male dies, movable members of said hydraulic power cylinders mounted reciprocatingly with respect to said frame; lead screws adapted to interact through their threading, with said flywheels, said lead screws being articulated at one end thereof to said slides carrying said male dies and with the other end being locked-in with said movable members of said hydraulic power cylinders.

4,191,045

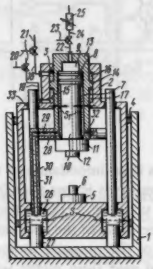
POWER HAMMER WITH OPPOSED MOVEMENT OF RAM AND BOLSTER

Georgy K. Stepantsov, ulitsa Belinskogo, 21, kv. 36; Valentin S. Abramov, ulitsa Dekabristov, 191, kv. 91, both of Kazan; Jury N. Bloschitsyn, Yasenevo, mikroraion 1, korpus 1, kv. 141, Moscow, and Raif R. Zaripov, ulitsa Gvardeiskaya, 24, kv. 74, Kazan, all of U.S.S.R.

Filed Jul. 11, 1978, Ser. No. 923,684

Int. Cl.² B21J *7/22*

U.S. Cl. 72—407 **4 Claims**



1. A power hammer with opposed movement of ram and bolster comprising: a stationary main frame provided with guides; a power frame accommodated in the guides of said main frame with provision for vertical displacements; a bolster secured to said power frame and providing support for a blank; an actuating cylinder mounted on said power frame and having a piston positioned for movement therein; a space below the piston being filled with a fluid under a pressure for returning the piston into, and retaining it in, an initial position as well as with a space above the piston serving as a gas chamber; a ram carrying a top die and attached to a rod of the piston of said actuating cylinder; a means for accelerating said power frame by an additional force which is at least equal to the weight of the frame, serves to displace the power frame vertically and comprises spaces provided in lower portions of said power frame which are filled with a fluid and communicate with the space below the piston of said actuating cylinder; vertical plungers which rest on said main frame and extend inside said lower portion spaces of said means for accelerating the power frame, the ratio of the aggregate cross-sectional area of said plungers to the cross-sectional area of the space below the piston of said actuating cylinder being half as much again to twice the ratio of the mass of movable components of the hammer to the mass of the piston integrally with the piston rod, ram and top die.

4,191,046

PERMEABILITY METERS

Richard R. Baker, Dibden Purlieu, and Barry G. Bunn, Shirley, both of England, assignors to British-American Tobacco Company Limited, London, England

Filed Jun. 26, 1978, Ser. No. 918,708

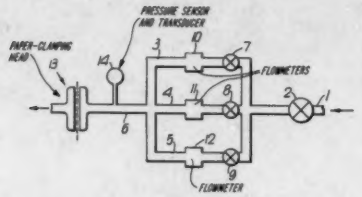
Claims priority, application United Kingdom, Jul. 1, 1977, 27629/77

Int. Cl.² G01N *15/08*

U.S. Cl. 73—38 **4 Claims**

1. An instrument for measuring the gas permeability of a gas permeable paper of high permeability, the instrument including a clamping head having clamping faces and gas-flow passageway means and arranged to clamp paper between said clamping faces so that a portion of the paper extends across the cross-section of said gas-flow passageway means; gas supply means via which gas under pressure can be supplied to the passageway means of the clamping head, the gas supply means

including a flow meter and an adjustable control valve to control the flow rate of gas in said supply means; and pressure indicating means including a pressure sensor responsive to gas pressure located adjacent to but upstream of the clamping faces to indicate gas pressure differential across said portion of the paper, the passageway between the clamping head and the pressure sensor being dimensioned to provide minimal impe-



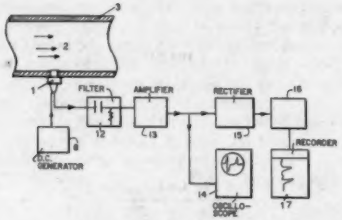
dance so that the gas flow impedance of the instrument from the pressure sensor onwards is less than 0.1% of the set pressure, that is 0.01 cm water at 50,000 cubic meters per minute gas flow so that, in operation of the instrument, the flow rate of gas, at a set reading of the pressure indicating means, can be determined by use of said flow meter with substantially no need for a correction factor to be applied to the flow rate reading to compensate for instrument impedance effects.

4,191,047

DEVICE FOR DETECTING THE INITIAL SETTLING OF THE SOLID PHASE IN SOLID-LIQUID SUSPENSIONS

Virgilio Arrigoni, San Donato, Milan, Dario Ercolani, Urbino, and Francesco Ferrini, Fano, all of Italy, assignors to Snamprogetti, S.p.A., San Donato Milan, Italy

Filed Apr. 27, 1978, Ser. No. 900,738
Claims priority, application Italy, May 5, 1977, 23192 A/77
Int. Cl.[2] G01N *33/00*
U.S. Cl. 73—61.4 **4 Claims**



1. A device for detecting the degree of settling of the solid phase of a solid-liquid suspension in a long-distance conveying duct comprising:

a set of polarizing electrodes mounted to the duct and having a difference in potential maintained between said electrodes in order to induce an overall motion of the ions present in the suspension,

at least one detecting and measuring electrode mounted to the duct in a predetermined position relative to one of said polarization electrodes to receive a signal due to the modification of the ionic distribution which varies as the speed and flow of the suspension varies,

means to detect AC components of said signal,

means to process said AC components, and,

means using said processed components to indicate the degree of settling.

4,191,048

RED-VISIBLE DYE PENETRANT COMPOSITION AND METHOD EMPLOYING SAME

Orlando G. Molina, Westminster, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 5, 1978, Ser. No. 939,551
Int. Cl.[2] G01M *19/00*
U.S. Cl. 73—104 **35 Claims**

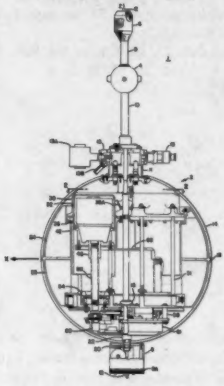
1. A method for detecting cracks and other defects in the surface of an object which comprises applying to said surface a liquid dye penetrant composition comprising a nonionic surfactant, and a liquid azo dye composition which is soluble or miscible in said surfactant, said dye composition consisting essentially of an azo dye containing C_5–C_{12} alkyl beta naphthols, or mixtures thereof, said dye composition being a single-phase liquid, removing excess dye penetrant composition from said cracks and defects in said surface, and viewing the surface of said object under lighting conditions to obtain colored traces from the dye in said cracks and other defects.

4,191,049

SYSTEM FOR MEASURING OCEAN CURRENT

Philip N. Bowditch, Cohasset; John M. Dahlen, Duxbury; John F. McKenna, Jr., Gloucester; John T. Shillingford, Jr., Milton; Frank J. Siraco, Malden, and William E. Toth, Bolton, all of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Aug. 16, 1978, Ser. No. 934,014
Int. Cl.[2] G01W *1/00*
U.S. Cl. 73—170 A **7 Claims**



1. A system for measurement of ocean current near the surface wave field, comprising:

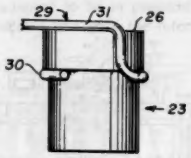
an adjustable buoyancy platform and associated current sensor affixed thereto, and

means to limit said platform to motion along a mooring line passing between two vertically displaced points, and to maintain said platform substantially free to move in the vertical direction in response to pressure gradients from said surface wave field, said means including an upper roller assembly affixed to the top of said platform and a lower roller assembly affixed to the bottom of said platform, said roller assemblies each including a plurality rollers adapted to freely track said mooring line.

4,191,050
LIQUID LEVEL INDICATING FLOATS

Eugene Kask, Willimantic, Conn., assignor to Rogers Corporation, Rogers, Conn.

Filed Oct. 18, 1978, Ser. No. 952,497
Int. Cl.² G01F *23/06*
U.S. Cl. 73—322.5 3 Claims

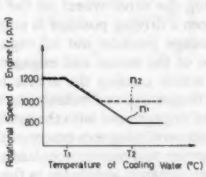


1. A liquid level indicating float comprising a generally cylindrical body portion terminating in an outwardly protruding cylindrical ledge having an upper surface and a lower surface, said ledge having a predetermined thickness, and a supporting arm having a loop which engages said lower surface and having an elongated end which engages said upper surface.

4,191,051
ENGINE IDLING SPEED CONTROL SIGNAL GENERATOR

Shoji Kawata, Okazaki, and Naoji Sakakibara, Chiryu, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Jul. 13, 1978, Ser. No. 924;321
Claims priority, application Japan, Jul. 20, 1977, 52/86787
Int. Cl.² G01K *13/00*
U.S. Cl. 73—347 8 Claims



1. An engine idle speed control signal generator circuit comprising:

a thermometer circuit including a thermal sensor responsive to the temperature of the cooling water in an engine to produce an output signal level indicative of the temperature;

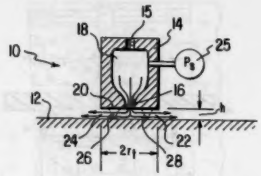
a first cut-off bias circuit limiting the output signal level of the thermometer circuit below a predetermined upper limit level representing one limit of desired engine idle speed; and

a second cut-off bias circuit maintaining the output signal level of the thermometer circuit above a predetermined lower limit level representing the opposite limit of desired engine idle speed.

4,191,052
NON-CONTACT FLUERIC TEMPERATURE SENSING METHOD AND APPARATUS

Tadeusz M. Drzewiecki, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 27, 1978, Ser. No. 963,720
Int. Cl.² G01K *11/00*
U.S. Cl. 73—357 19 Claims



15. A method of sensing the temperature of an object without requiring physical contact therewith, comprising the steps of:

directing a flow of fluid through a nozzle opening onto a sensing head toward a surface of said object so that said fluid assumes the temperature of said object;

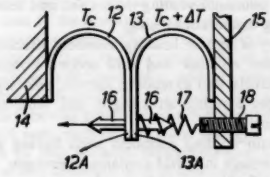
establishing the distance between said sensing head and said surface; and

sensing the back pressure developed by said fluid.

4,191,053
TEMPERATURE-RESPONSIVE ACTUATOR

William B. Hart, Ipswich, and Reginald T. Williams, Hadleigh, both of England, assignors to Delta Materials Research Limited, Ipswich, England

Filed Nov. 30, 1978, Ser. No. 964,935
Int. Cl.² G01K *5/60*
U.S. Cl. 73—363.1 11 Claims



1. A differential temperature detector comprising

(a) a first resilient member having a fixed part and a relatively movable part; and

(b) a second resilient member having a fixed part and a relatively movable part;

(c) each of said first and second resilient members being made essentially of a shape memory effect material having an elastic modulus which varies significantly with temperature in a reversible manner over a transition temperature range,

(d) said movable parts of said resilient members being coupled together with said members stressed in opposition,

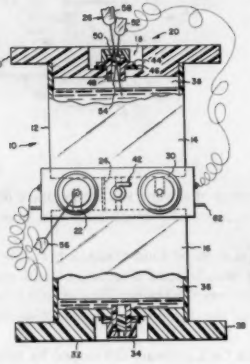
(e) whereby the position of said movable part of one of said members relative to said fixed part is indicative of the difference in temperatures of said members.

4,191,054

ATMOSPHERIC SAMPLING APPARATUS

Marvin Jacoby, Rochester, N.Y.; Richard Jacoby, Haverford, Pa., and Robert Ellson, Rochester, N.Y., assignors to Air Test Labs, Inc., Rochester, N.Y.

Filed Oct. 23, 1978, Ser. No. 953,349
Int. Cl.[2] G01N 1/24
U.S. Cl. 73—421.5 R 15 Claims



1. An improved apparatus for the collection of atmospheric samples, comprising:

a sealed first container member filled with liquid material therein;

a sealed second container member positioned below said sealed first container member;

first container venting means for the controlled introduction of the atmosphere surrounding said apparatus into said first container;

second container venting means for the controlled dispersal of the atmosphere within said second container into the surrounding atmosphere;

said first container venting means and said second container venting means comprising;

a plurality of septum holding members attached to said first container member and said second container member respectively and extending therein, said septum holding members forming an airtight seal with said container members;

said septum holding members each having a passageway therethrough into said container members;

a septum positioned within said passageway, said septum forming an airtight seal within said passageway; and

a hollow needle member having an aperture proximate its tip, said needle member being insertable through said septum whereby a gaseous atmosphere may pass into or out of the container member;

restrictive flow channel means between said first and second container members for the controlled passage of said liquid therethrough, said passage of liquid creating a vacuum in said first container member whereby a portion of said surrounding atmosphere is controlledly drawn through said first container venting means and into said first container member where it is retained;

sample removal means for permitting the withdrawal of a desired quantity of said retained atmosphere from within said first container member; and

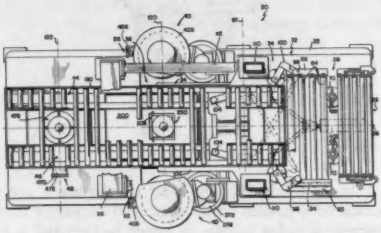
base means for the support of said apparatus.

4,191,055

DYNAMIC IMBALANCE DETERMINING SYSTEM

Donald E. Orem, Indianapolis; Vernon P. Holmes, Danville, both of Ind., and Thomas J. Bacsanyi, Novi, Mich., assignors to Ransburg Corporation, Indianapolis, Ind.

Filed Jul. 25, 1978, Ser. No. 927,760
Int. Cl.[2] G01M 1/22
U.S. Cl. 73—462 13 Claims



1. A drive mechanism for use with an apparatus for determining the amount and location of imbalance of an article having two planes in which it is to be balanced and an axis about which it is to revolve, the apparatus including a base, means for supporting the article for substantially free revolution with respect to the base, a lever extending generally parallel to the axis of revolution of the article, means for mounting the lever for movement with the article supporting means, means for generating input signals in response to force exerted between the lever and the base as the article is revolved, means for generating first output signals related to the imbalance in the first plane and second output signals related to the imbalance in the second plane in response to the input signals, and means for coupling the input signal generating means to the output signal generating means, the input signal generating means including first and second input signal generating means, means for mounting the first input signal generating means between the lever and the base, means for mounting the second input signal generating means between the lever and the base a first predetermined non-zero distance from the first input signal generating means measured along the axis, the second input signal generating means being mounted a second predetermined non-zero distance from the first plane measured along the axis, and the drive mechanism including a motor and drive wheel mounted for rotation by the motor, means for movably mounting the drive wheel on the base for selective movement between a driving position in engagement with the article and a storage position out of engagement with the article, excitation of the motor and engagement of the drive wheel with the article causing the article to accelerate to a desired rotation frequency, and subsequent movement of the drive wheel out of engagement with the article permitting said article to coast and permitting movement of the article relative to the base in response to dynamic imbalance in the article free of the effect of any dynamic imbalance in the drive wheel, said movement generating said output signals which are used to determine the amount and location of inbalance of said article.

4,191,056

PRESSURE GAUGE SPRING

Edward S. Holden, Cambridge, Mass., assignor to Tube Engineers, Inc., Waltham, Mass.

Filed Aug. 29, 1978, Ser. No. 937,852
Int. Cl.[2] G01L 7/04
U.S. Cl. 73—743 22 Claims

1. A spring assembly for a gauge comprising:

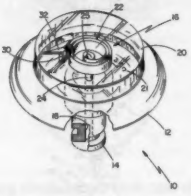
a hollow metal tube adapted to change in volume in response to differential pressures applied across the walls thereof, said tube having

a neck portion adapted to be connected to a fitting of the gauge,

a body portion connected at one end to said neck portion, the walls of said body portion being cold worked to a reduced thickness to thereby increase the yield point thereof to a spring temper, and

the other end of said body portion being sealed,

the interior of said neck portion adapted to be in pressure communication with the fitting, and the interior of said body portion adapted to be in pressure communication through its unsealed end with the interior of said neck portion,



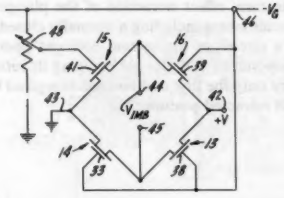
whereby a change in the pressure applied to the fitting is communicated to the interior of said body portion changing the differential pressure across the walls of said body portion and causing a corresponding change in the volume thereof, the increased yield point of the cold worked walls of said body portion providing improved resistance of said spring to cracking, fatigue, and permanent deformation of said tube otherwise caused by said changing pressure.

4,191,057

INVERSION LAYER SPRAIN GAUGE

Heinz H. Busta, Park Ridge, Ill., assignor to Gould Inc.

Filed Jun. 28, 1978, Ser. No. 920,137
Int. Cl.² G01B 7/16
U.S. Cl. 73—777 **5 Claims**



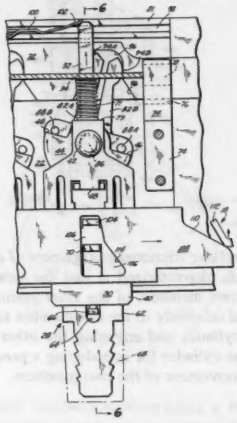
1. A strain gauge element comprising, in combination: a flexible beam having a layer of one charge-carrier-type silicon; four regions of the opposite charge-carrier-type silicon formed in said layer of said one charge-carrier-type silicon, said regions being disposed in a four corner pattern with each individual region being spaced from two of the other regions to define with said two of the other regions a pair of channels of said one charge-carrier-type silicon; electrically conductive layers deposited on each of said four regions; additional electrically conductive layers deposited on but insulated from said channels between said regions so that each adjacent pair of regions together with its intermediate channel and insulated electrically conductive layer defines a field effect transistor; means electrically coupling said transistors in a Wheatstone bridge circuit so that deformation of said flexible beam produces a proportional imbalance signal in said bridge circuit; and means for applying a gate biasing voltage to each of said insulated electrically conductive layers so as to render said transistors conductive, said voltage applying means permitting at least one gate bias voltage to be varied so as to electrically balance the bridge when there is no strain load.

4,191,058

LOW PROFILE PUSHBUTTON TUNER WITH IMPROVED CARRIAGE MOVING MECHANISM

Russell D. Stamm, El Paso, Tex., assignor to General Instrument Corporation, Clifton, N.J.

Filed Jun. 5, 1978, Ser. No. 912,410
Int. Cl.² H03J 5/08
U.S. Cl. 74—10.33 **15 Claims**



1. In a tuner assembly comprising a support, a part movably mounted on said support, a tuner, an operative connection between said part and said tuner whereby said tuner is tuned in accordance with the position of said part, and a plurality of manually actuated keys mounted on said support and individually movable in a given direction between operative and inoperative positions, each of said keys having a cam thereon adjustably positionable about an axis, a plurality of arm means, one for each key, articulately mounted on said support, said part having a plurality of apertures, a portion of each of said arm means being received in a corresponding aperture, each cam, when its key is in operative position, engaging and moving the corresponding arm means to position said part and thereby control the tuning of said tuner; the improvement which comprises said arm means normally loosely engaging said part, the cam of the operative key and the corresponding arm means comprising means effective to cause that arm means to firmly engage said part, thereby accurately to position said part substantially without lost motion; said arm means comprising a pair of arms independently articulately mounted on said support and each having a portion received in a corresponding aperture in said part, each of said cams having a pair of cam surfaces, each of said surfaces being effective to engage a different one of said arms and to urge said different one of said arms into said firm engagement with said part as the corresponding key moves to its said operative position.

4,191,059

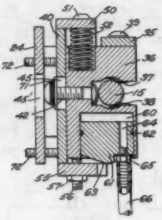
LINEAR ACTUATOR

Robert A. Vanslette, Medfield, Mass., assignor to Brown & Sharpe Manufacturing Company, North Kingstown, R.I.

Filed Oct. 25, 1977, Ser. No. 844,582
Int. Cl.² F16H 21/40
U.S. Cl. 74—25 **3 Claims**

1. Transducer for transducing a rotational movement of a shaft into a linear movement of an actuator, the transducer having a rider assembly mounted for movement axially on the shaft, the rider assembly comprising two members and three rollers with their circumference in frictional contact with the shaft, the roller axes being disposed at an acute angle with respect to the shaft axis and spaced circumferentially around

the shaft, a means mounting these two members of the rider assembly relatively movable with respect to each other, one of these members carrying a roller on one side of the shaft axis and the other member carrying two rollers on the other side of the shaft axis, a spring arrangement for relatively moving these members until the rollers carried thereby are in frictional contact with the shaft, and a means to relatively move these



members to relieve frictional engagement of one of the rollers with the shaft, characterized in that the means for relatively moving the two members of the rider assembly comprises a cylinder fixed relatively to the one member and a piston movable in the cylinder and engaging the other member, and a conduit to the cylinder for introducing a pressurized fluid for the relative movement of the two members.

4,191,060

CAR SIDE WINDOW LIFTING MECHANISM

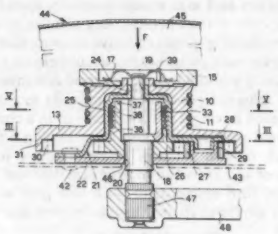
Terenzio Sessa, Via Albani 5, Varese, Italy

Filed Dec. 12, 1977, Ser. No. 859,546

Claims priority, application Italy, Mar. 31, 1977, 21949 A/77

Int. Cl.[2] F16H *29/02;* **E05F** *11/48;* **F16D** *67/00;* **B66D** *3/16*

U.S. Cl. 74—89.22 **10 Claims**



1. A wire-actuated car side window lifting mechanism, more particularly for motor cars, of the single-shaft control type having incorporated therein a wire-tensioning device comprising a wire-winding drum, a first grasping member for either end of the wire, integral with the drum and a second fastening member for the other end of the wire connected to the drum with a one-way clutch which permits the mutual sliding between said drum and said second fastening member, characterized in that the control shaft is connected to the drum via a reducing gear train and to the second fastening member via an automatically releasable mechanical linkage which is released as the stress impressed to the wire exceeds a preselected magnitude.

4,191,061

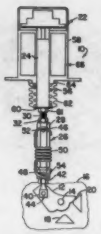
SOLENOID-OPERATED FUEL FLOW CONTROL FOR FUEL INJECTION SYSTEM

Wayne R. Miller; David D. Latham, and Joseph C. Spencer, all of Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jun. 12, 1978, Ser. No. 914,349

Int. Cl.[2] F16H *21/44*

U.S. Cl. 74—108 **8 Claims**



1. A solenoid-operated fuel flow control for a fuel injection system, comprising: first and second closely spaced stops; a fuel flow control lever pivotally mounted adjacent said stops for movement between a fuel-off position, wherein it engages the first stop, and a fuel-on position wherein it engages the second stop; a solenoid including a shiftably mounted plunger surrounded by first and second coils which are energizable to move the plunger to a retracted position and biasing means urging the plunger to an extended position which it occupies when the coils are de-energized; linkage means connecting the plunger to the fuel flow control lever for moving the latter from its fuel-off to its fuel-on position when the first and second coils are energized to effect retraction of the plunger; electrical control circuit means connected to the first and second coils for selectively effecting simultaneous energization thereof to, in turn, effect retraction of the plunger; and said electrical circuit means including a normally closed switch for completing a circuit to the second coil and operable to be opened in response to said plunger reaching its retracted position, whereby only the first coil remains energized to hold the plunger in its retracted position.

4,191,062

CHAIN DRIVE AND AUTOMATIC CHAIN TENSIONING UNIT

Lawrence R. Gardner, Aurora, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed May 1, 1978, Ser. No. 901,718

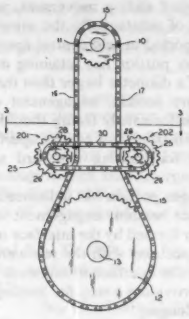
Int. Cl.[2] F16H *7/16*

U.S. Cl. 74—242.11 R **6 Claims**

1. An automatic drive chain tensioner, which comprises:

a pair of idler assemblies, with each idler assembly comprising an idler sprocket and an indexing sprocket on each side of, and concentrically connected to, the idler sprocket with each idler assembly being adapted to be positioned on the outside of a drive chain loop on a chain run between a drive and driven sprocket with the idler sprocket thereof adapted to be engaged in the drive chain

and with the idler assemblies on different and opposite spaced-apart drive chain runs; and



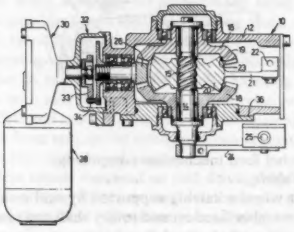
a pair of indexing chain loops, each one of which is adapted to engage an indexing sprocket on each of the spaced-apart idler assemblies on the same side of the drive chain.

4,191,063

SERVO DEVICE, ESPECIALLY FOR REVERSIBLE GEARS IN MOTORBOATS

Kjell-Idar Borgersen, Hjalteby, Sweden, assignor to AB Volvo Penta, Gothenburg, Sweden

Filed Oct. 6, 1977, Ser. No. 839,829
Claims priority, application Sweden, Oct. 7, 1976, 7611140
Int. Cl.[2] F16H *35/00*
U.S. Cl. 74—388 R **11 Claims**



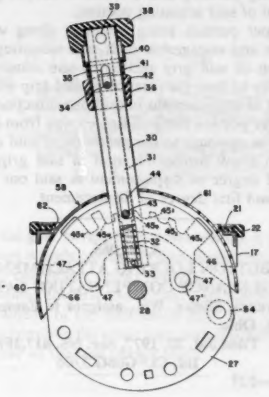
1. Servo device for amplifying the force in a mechanical control apparatus, movable in two opposite directions, when said apparatus is displaced in either direction, comprising two gears rotatably disposed in a housing, and coaxial with a rotatable shaft, means comprising a servo motor and a driving connection therefrom to said gears for driving said gears in counterrotation, and a nut screwably arranged on screw splines on the shaft between the gears, said nut when screwed along said splines coming into frictional contact via annular friction surfaces with corresponding annular surfaces on the gears, said nut, said splines and one of the gears making a releaseable driving connection with one another, characterized in that radially directed arms are attached to the shaft and to the nut, with control cable attachment means for transmitting the input operating force to one arm, while an additional force is contributed from a respective one of said gears via the shaft and splines to the other arm.

4,191,064

LEVER CONTROL

Richard D. Houk, Stow, and Marvin H. Jones, Wooster, both of Ohio, assignors to Samuel Moore and Company, Aurora, Ohio

Filed Mar. 27, 1978, Ser. No. 890,132
Int. Cl.[2] G09F *9/00*; G05G *1/04*
U.S. Cl. 74—475 **8 Claims**



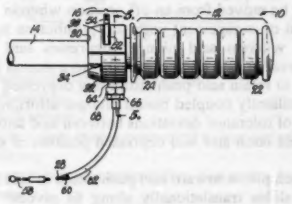
1. Lever control mechanism comprising a frame having spaced-apart mounting plates and a substantially flat cover plate traversing the outer ends of said plates, a transverse shaft secured in said mounting plates, a control plate rotatable on said shaft, a handle lever connected to said control plate and extending through said cover plate, a gate plate having a series of indentations secured to one of said mounting plates, a detent slidable on said lever and biased to engage selectively in said indentations, and an arcuate channeled housing attached to said lever extending movably and outwardly through and in sealed relation to said cover plate and enclosing said gate and detent mechanism.

4,191,065

THROTTLE TWIST GRIP

Gary L. Golobay, R.R. #3, Box 252, Augusta, Kans. 67010; Ted E. Deubner, 3336 Bonn St., Wichita, 67217, and Anthony F. Beugelsdyk, 7509 Hale St., Wichita, both of Kans. 67212

Filed Feb. 7, 1978, Ser. No. 875,820
Int. Cl.[2] G05G *1/08, 5/04, 5/18*
U.S. Cl. 74—489 **9 Claims**



1. A twistable grip assembly for shifting a flexible control line and of the type supported on a handlebar or the like comprising:

an elongate, hand grip section;

means adapted to be secured to said handlebar adjacent one extremity of said grip section and slidably engaging the latter for rotatably mounting said grip section on said handlebar;

spool means fastened to said grip section adjacent said one

extremity of the latter for winding and unwinding said line thereon in response to rotation of said grip section; and

latch means fastened to the combination of said spool means and said grip section for selectively controlling the displacement through which said grip section may be rotated,

said latch means including a manually operable, shiftable actuating portion, and a shiftable keeper portion under control of said actuating portion,

said keeper portion being rotatable along with said grip section and engageable with said mounting means upon rotation of said grip section in one rotational direction whereby to limit the rotation of said grip section to a first degree of displacement in said one direction,

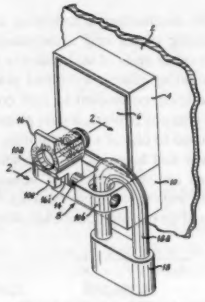
said keeper portion being shiftable away from said mounting means in response to the operation of said actuating portion to allow further rotation of said grip section to a second degree of displacement in said one direction beyond said first degree of displacement.

4,191,066

PUSHBUTTON LOCKING ATTACHMENT WITH TOLERANCE COMPENSATING LATCH

John J. Keranen, Sussex, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jul. 20, 1977, Ser. No. 817,361
Int. Cl.[2] G05G 5/06
U.S. Cl. 74—527 **2 Claims**



1. A latching device for a control having a pushbutton comprising:

a base mounted to said control;

a latch having a biased plunger resiliently coupled thereto; and

means mounting said latch to said base such that said latch may be moved from an off position wherein said plunger is out of engagement with said pushbutton to a first position wherein said plunger depresses said pushbutton, whereafter said latch is movable to a second latched position to retain said pushbutton in a depressed position;

said resiliently coupled biased plunger affording compensation of tolerance deviations between said latched position of said latch and said depressed position of said pushbutton;

said latch pivots toward said pushbutton to said first position and slides translationally along its pivotal axis to said latched position;

said base has a pivot stop portion which engages said latch in said latched position to prevent pivoting of said latch away from said pushbutton;

said plunger is an elongated member having an enlarged generally hemispherical head portion at the rear for engaging said pushbutton, a central cylindrical portion, and a front smaller diametered cylindrical portion;

said latch has a generally tubular portion with an aperture therethrough of different diameters, a rear aperture section, a central constricted aperture section of smaller diameter, and a front aperture section;

said plunger is disposed in said aperture in said latch for forward-rearward sliding movement, said front plunger portion being of substantially the same diameter as and guidingly supported in said central aperture section;

said front plunger portion has retaining means at the front end thereof of a diameter larger than the diameter of said central aperture section, engagement of said retaining means with the forwardly facing shoulder formed by the interface of said front and central aperture sections providing a stop for limiting rearward movment of said plunger;

said central plunger portion has a diameter larger than said central aperture section, engagement of the forwardly facing shoulder formed by the interface of said central and front plunger portions with the rearwardly facing shoulder formed by the interface of said central and rear aperture sections providing a stop for limiting forward movement of said plunger;

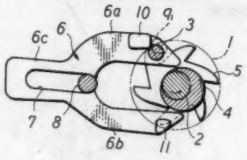
said plunger is biased rearwardly away from said latch towards said pushbutton by a helical compression spring concentrically surrounding said plunger in said rear aperture section and bearing between the forwardly facing shoulder formed by the interface of said enlarged head and central portions of said plunger and said rearwardly facing shoulder formed by said interface of said central and rear aperture sections.

4,191,067

RATCHET FEED MECHANISM

Masaaki Oishi; Itaru Ashida, and Tetsuro Suzuki, all of Tokyo, Japan, assignors to Kabushiki Kaisha Seikosha, Japan

Filed Aug. 3, 1977, Ser. No. 821,503
Claims priority, application Japan, Aug. 3, 1976, 51-92488
Int. Cl.[2] G05G 1/00
U.S. Cl. 74—577 M **7 Claims**



1. A ratchet feed mechanism comprising:

a rotary shaft,

a ratchet wheel rotatably supported by said rotary shaft,

a rotary member fixed on said rotary shaft and spaced axially from said ratchet wheel,

an operation pin fixed on said rotary member eccentrically on said rotary shaft so as to orbit about the axis of said rotary shaft, said pin projecting axially of said rotary shaft from a side of said rotary member facing said ratchet wheel,

an eccentric cam fixed on said rotary shaft between said rotary member and said ratchet wheel, and

a place shift-up lever supported so as to be capable of rocking and sliding movement in a plane perpendicular to said rotary shaft and having a forked leg plate with spaced legs receiving said eccentric cam between them,

one leg of said forked leg plate having on a first face a hook pawl engageable by said shift-up lever in a feed direction and on a second face a feed pawl engageable with said ratchet wheel to rack said ratchet wheel during movement of said place shift-up lever in said feed direction, and

the other leg of said forked plate having on said first face a return pawl engageable by said operation pin to move said place shift-up lever in a return direction,

said legs of said forked leg plate being engageable by said cam for rocking said place shift-up lever to bring said hook pawl and return pawl alternately into engagement with said operation pin and for bringing said feed pawl into engagement with said ratchet wheel during movement of said place shift-up lever in said feed direction.

4,191,068

DRIVE ARRANGEMENT FOR SLIDING ROOFS, WINDOW PANES AND OTHER SIMILAR MEMBERS IN MOTOR VEHICLES

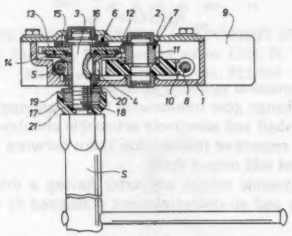
Hans Jardin, Inning; August Hirschberger, Munich, and Karl-Heinz Isleif, Percha, all of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH and Co., Fed. Rep. of Germany

Filed Jun. 22, 1978, Ser. No. 918,270

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1977, 7720015[U]

Int. Cl.² F16H *55/02*

U.S. Cl. 74—625 **12 Claims**



1. A drive arrangement for sliding roofs, window panes and other similar sliding members in motor vehicles comprising:

a motor drive;

a driving shaft;

a driving pinion for displacing the sliding member, said pinion being arranged on said driving shaft, and being constrained to rotate with said driving shaft;

a clutch having a first part constrained for movement with the driving shaft and a second part displaceably mounted relative to said first part for interconnecting said motor drive with said drive pinion in a first relative position of said first and second parts and for disengaging said drive pinion from said motor drive in a second relative position of the first and second parts;

adjustment means mounted on said driving shaft for adjusting the driving force transmittable between said first and second parts, said adjustment means being connectable to a manually operable handle; and

locking means for securing said adjustment means relative to said driving shaft in a plurality of positions for enabling emergency operation of the sliding member by said handle.

4,191,069

MULTI-SPEED GEAR TRANSMISSION ESPECIALLY FOR USE IN WARPING MACHINES

Luigi Sasso, Frazione Orazzo, Strona Biellese (Vercelli), Italy

Filed May 5, 1978, Ser. No. 903,335

Claims priority, application Italy, May 19, 1977, 68147 A/77

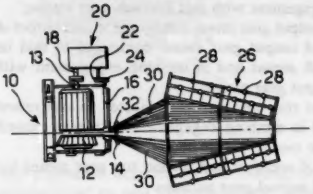
Int. Cl.² F16H *37/06*

U.S. Cl. 74—681 **3 Claims**

1. Multi-speed gear transmission of the type comprising a drive input shaft for connection to a warp cylinder of a sectional warping machine, having a displaceable thread carriage, a drive output shaft for connection to displacement means for effecting movement of the thread carriage, and a first gear mechanism having several gear ratios interposed between said drive input and drive output shafts,

wherein the improvement comprises:

a second gear mechanism with several gear ratios mechanically coupled to the drive input shaft in parallel with said first gear mechanism,



a diffenential gear having two crown wheels, a planet carrier and planet wheels carried by said planet carrier and meshing with said planet crown wheels,

means coupling the first and second gear mechanisms to said crown wheels of the differential gear,

and means coupling the other said crown wheel of the differential gear to the said output shaft.

4,191,070

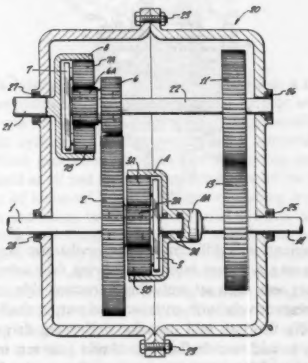
PLANETARY TRANSMISSION WITH PLURAL POWER PATHS

Chester L. McKinniss, 117 S. Figuroa, Santa Ana, Calif. 92703

Filed Mar. 31, 1978, Ser. No. 892,143

Int. Cl.² F16H *37/06, 57/10*

U.S. Cl. 74—682 **3 Claims**



1. A transmission device comprising:

input shaft means;

output shaft means;

first planetary gear means connected to one end of said input shaft means;

first ring gear means connected to one end of said output shaft means;

said first planetary gear means and said first ring gear means arranged to be in meshing engagement;

first sun gear means rotatably mounted adjacent said one end of said input shaft means and in meshing engagement with said first planetary gear means;

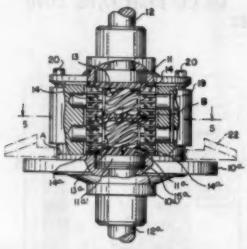
retarding means for controlling the rotation of said first sun gear means in order to selectively engage said input shaft means and said output shaft means via the engagement of said first planetary gear means and said first ring gear means;

bearing means included in said first ring gear means for supporting said one end of said input shaft means;
intermediate shaft means;
secondary planetary gear means connected to one end of said intermediate shaft means;
second sun gear means rotatably mounted adjacent said one end of said intermediate shaft means, and in meshing engagement with said first sun gear means;
first output gear means connected to said output shaft means;
second output gear means connected to said intermediate shaft means and in meshing engagement with said first output gear means;
second ring gear means connected to said retarding means and in meshing engagement with said second planetary gear means; and
each of said first and second sun gear means includes first and second gear portions.

4,191,071
TORQUE EQUALIZER OR UNBALANCER FOR A CROSS-AXIS PLANETARY DIFFERENTIAL GEAR COMPLEX

Vernon E. Gleasman, 3808 Kirkwood Rd., Cleveland, Ohio 44121, and Robert N. Benjamin, 1830 Kathryn Dr., Westlake, Ohio 44145

Continuation-in-part of Ser. No. 433,741, Jan. 16, 1974, abandoned. This application Nov. 25, 1974, Ser. No. 526,635
Int. Cl.² F16H *1/38*
U.S. Cl. 74—715 **3 Claims**

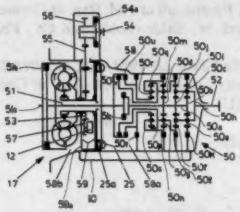


1. In combination, a differential gear mechanism housed in a case and having a power input and having two substantially identical gear sets, each set including a traction side gear each connected respectively with an associated output shaft extending outwardly through said case for delivering drive torque respectively to said two shafts, each of said gear sets including a plurality of transfer gear complexes, each complex having a centrally located helical portion in mesh with its associated side gear, each complex having a reversible balancing gear at each end of its associated helical portion, each balancing gear rigidly connected with its associated helical portion and coaxial therewith, said side gears assembled in axially aligned contiguous relationship in said case and with the helix angle of said side gears in the same relative position with their teeth inclined in the same direction so that the end thrust of said two side gears is additive in one direction toward one output shaft when said differential mechanism is propelling an associated vehicle in a given direction, and a friction-modifying washer applied at the point of exit from said case of said one output shaft only, and said washer being between and in contact with the side gear connected with said one shaft on one hand and with said case surrounding said one shaft on the other hand, whereby to substantially modify the torque delivered to said two output shafts by said differential gear mechanism.

4,191,072
TRANSMISSION WITH HYDRODYNAMIC TORQUE CONVERTER AND RETARDER

Friedrich J. Ehrlinger, Friedrichshafen, and Horst Böck, Immenstaad, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Dec. 14, 1977, Ser. No. 860,315
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1976, 2656669
Int. Cl.² F16H *47/00*; B60K *41/26*; F16H *57/02*
U.S. Cl. 74—732 **10 Claims**



1. A transmission assembly comprising:
a speed-change gear transmission having an input shaft, an output shaft and selectively actuatable clutches for establishing respective transmission ratios between said input shaft and said output shaft;
a hydrodynamic torque converter having a driven input element and an output element connected to said input shaft;
a hydrodynamic retarder having a stator and a rotor and disposed between said torque converter and said gear transmission;
a common housing for said torque converter, said retarder and said gear transmission, said housing being separated by a partition into a first housing section containing said retarder and said gear transmission and a second housing section containing said converter, said partition directly sealing said sections from one another in a fluid-tight manner and being exposed to the interiors of both said sections, said stator being affixed directly to said partition, said partition exclusively closing off both said sections from one another;
a hydraulic pump mounted on said partition; and
a converter counterpressure valve, a lubricating valve and at least one control valve for the converter and the retarder formed directly in said partition, said partition being further formed directly with passages connected to said pump, said retarder, said converter, and said valves.

4,191,073
DRIVE ASSEMBLY HAVING AN IMPROVED SUN GEAR MOUNTING

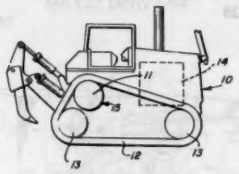
Arthur J. Ritter, Jr., Metamora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 26, 1977, Ser. No. 800,825
Int. Cl.² F16H *57/10*
U.S. Cl. 74—764 **4 Claims**

1. In a drive assembly having a driver shaft rotatably carried in a support for rotation about an axis, an output sprocket carried by a first carrier rotatably carried coaxially of said shaft, and a gear assembly for driving the carrier from the shaft including a first sun gear rotatable with said shaft about said axis, a second carrier, a plurality of first planetary gears on said second carrier driven by said sun gear, an outer ring fixedly disposed coaxially of said shaft in meshed association with said first planetary gears, a second sun gear, and a plurality of second planetary gears rotatably mounted to said first carrier

and meshed with said outer ring gear and second sun gear, the improvement comprising:

mounting means for rotatably mounting the second sun gear to said first carrier coaxially of said shaft; and



seal means for sealing said second sun gear mounting means to said first carrier.

4,191,074

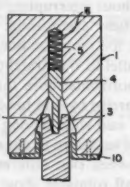
CHAIN SAW BAR GUIDE ALIGNMENT SYSTEM

William E. Sherman, P.O. Box 95, Silver City, N. Mex. 88061

Filed Jun. 2, 1978, Ser. No. 912,054

Int. Cl.[2] B23D *63/18*

U.S. Cl. 76—25 R **12 Claims**



1. A system for aligning and regapping a guide groove on a chain saw guide bar which includes a swaging tool comprising:

a U-shaped housing defining a longitudinal cavity, said housing having a striking surface;

a groove gauge which is movably mounted in said housing and which is adapted to fit into said guide groove and to conform said guide groove to its proper dimensions; and

a set of swaging surfaces positioned in said longitudinal cavity in such a manner as to engage the peripheral edges of said chain guide bar when downward force is applied to the striking surface of the said housing, forcing the guide groove in said bar against said groove gauge.

4,191,075

ROTARY CUTTING TOOL

Evgeny I. Morgunsky; Valery A. Sidorenko, and Vladimir A. Plotnikov, all of Minsk, U.S.S.R., assignors to Fiziko-Tekhnichesky Institut Akademii Nauk Belorusskoi SSR, U.S.S.R.

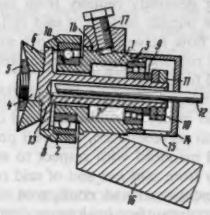
Filed Nov. 17, 1978, Ser. No. 961,741

Claims priority, application U.S.S.R., Dec. 8, 1977, 2547939

Int. Cl.[2] B23B *29/00*; B26D *1/12*

U.S. Cl. 82—36 R **2 Claims**

1. A rotary cutting-tool comprising: a stepped-diameter arbor having a central bore; a bearing accommodated on said stepped-diameter arbor; another bearing accommodated within the central bore of said stepped-diameter arbor; a cup-shaped cutting bit; a holder carrying said cup-shaped cutting bit and comprising a hollow shaft accommodated in the central bore of said stepped-diameter arbor, said shaft being journalled in said bearing accommodated within the central bore of said stepped-diameter arbor, and a sleeve encompassing said hollow shaft and journalled adjacent to said cutting bit in said bearing accommodated on said stepped-diameter arbor.



4,191,076

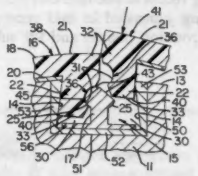
ROTARY ANVIL CONSTRUCTION

Jacob A. Bollmer; Joseph E. Stearns, both of Dayton, Ohio, and Alvin R. Brooks, Jr., Waynesville, N.C., assignors to Dayco Corporation, Dayton, Ohio

Filed Oct. 23, 1978, Ser. No. 954,063

Int. Cl.[2] B26D *7/20*

U.S. Cl. 83—13 **20 Claims**



1. In a rotary anvil construction comprising; a rotary anvil having an outer substantially cylindrical surface and having a pair of spaced holding surfaces extending radially inwardly from said cylindrical surface and defining opposed walls of a longitudinal groove in said anvil; a die-cutting mat attached against said anvil and having opposite end portions terminating in a pair of identical locking flanges extending from said end portions and being received within said groove; and a wedge for locking said flanges against said holding surfaces; the improvement wherein said wedge is an immobile locking wedge disposed within said groove and having fixed locking surface on each side thereof, each locking surface being spaced from an associated one of said holding surfaces to define a flange-receiving channel therebetween, and each of said flanges has an inner portion adjoining said mat and an outer portion adapted to be yieldingly compressed within an associated channel, each other portion having a cooperating locking surface which is snap-locked against an associated locking surface of said wedge to lock its flange in position once the associated outer end portion is yieldingly compressed within its associated channel.

4,191,077

BEARING BLOCK WITH AIR SUPPLY PASSAGE

Richard L. Edwards, Windsor Locks, and Martin Kesten, West Hartford, both of Conn., assignors to Preston Engravers, Inc., Windsor, Conn.

Filed Dec. 26, 1978, Ser. No. 972,894

Int. Cl.[2] B26D *7/06*

U.S. Cl. 83—99 **9 Claims**

1. For use in die-cutting press, a die-cutting roll assembly comprising:

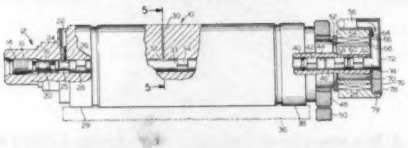
a die-cutting roll having a cylindrical cavity extending axi-

ally inwardly from one end thereof and having mounting means on the other end thereof adapted to be rotatably supported in the press, said roll having at least one aperture extending generally radially from said cavity to a location on the outside surface of said roll, said aperture enabling fluid flow between said cavity and said outside surface of said roll and comprising substantially the only outlet for fluid from said roll;

a generally cylindrical fluid-delivery manifold extending axially into said cavity from said one end of said roll for relative rotation therebetween, said roll preventing axial motion of said manifold with respect to said roll in the direction away from said one end of said roll, said manifold being dimensioned and configured to seat in said cavity with its outer surface in close proximity to the inner surface of said roll defining the corresponding portion of said cavity, said manifold having an axially extending passageway therein with an outlet comprising at least one generally radially extending port opening at a point on said outer surface thereof in a location for registry with said one aperture of said roll to permit fluid flow through said port and said aperture when in registry as a result of relative rotation therebetween, said manifold having an inlet communicating with said axial passageway thereof; and

a bearing-block assembly adapted for mounting in the press and including:

(i) a bearing-block body member having a generally cylindrical bearing recess in one face thereof, said one end of said roll being journaled in said recess of said body member for rotation therein and for substantial reten-



tion of said roll in a predetermined axial position in the press, and

(ii) a couplant member seated in said bearing-block body member adjacent said bearing recess, fixed in position axially of said bearing-block body-member recess, and rotatably adjustable in said body member relative to said body-member recess, said couplant member including an elongated conduit having an axially extending portion that has an outlet communicating with said inlet of said manifold, said elongated conduit further including a transversely extending portion extending from said axial portion to the periphery of said couplant member, said transversely extending portion having an inlet adapted for fluid communication with a source of pressurized fluid, said couplant member having a fluid coupling at said outlet of said axially extending portion, said fluid coupling having means thereon about said outlet engaged with said manifold at said inlet thereof to prevent axial rotation of said manifold relative to said fluid coupling but to permit free axial withdrawal of said manifold from said fluid coupling, coupling of said outlet of said axial portion to said inlet of said manifold providing fluid communication between them and permitting fluid flow from the source of pressurized fluid through the conduit, manifold, and aperture to the outside surface of said roll when said inlet of said transversely extending portion communicates with the source of pressurized fluid, adjustment of the rotational position of said couplant member thereby adjusting the rotational position of said manifold and the rotational position of said roll at which said port and said aperture register with each other.

4,191,078

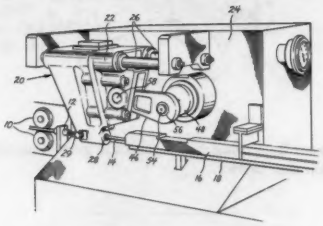
WIRE CUTTING FLYING SHEAR

Wilhelm A. Steinhilber, Guilford, Conn., assignor to Orion Machinery & Engineering Corp., Branford, Conn.

Filed Feb. 3, 1978, Ser. No. 875,076

Int. Cl.[2] B23D *25/04*

U.S. Cl. 83—320 **2 Claims**



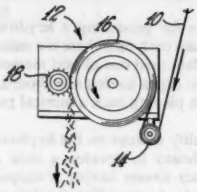
2. In a wire cutting-off machine having a frame and a feeding means for feeding wire longitudinally of itself in a straight line path continuously past a cutting station fixed relative to said frame, an improved flying shear mechanism for repeatedly cutting said wire without interrupting its feed by said feeding means, said flying shear comprising: a cutter head, means supporting said head for reciprocation relative to said frame along a first axis parallel to the straight line path of wire feed, said head having a horizontal bore through which said wire passes, a knife slide carried by said head for vertical reciprocation relative thereto, said slide having a knife portion which moves past one end of said bore to cut said wire as said slide is moved vertically between two different positions relative to said head, a crank shaft rotatable about a horizontal axis fixed relative to said frame and perpendicular to the vertical plane containing said straight line path of wire feed, a lever, means pviotally connecting said lever eccentrically to said crank shaft at one point along the length of said lever, means pivotally connecting said lever to said cutter head at another point along the length of said lever so that said head is horizontally reciprocated along said first axis as said shaft rotates, and means pivotally connecting said lever to said knife slide at still another point along the length of said lever so that said slide is also driven vertically between said two different positions relative to said head as said drive shaft rotates, said lever being connected at one of its ends to said crank, at the other of its ends to said knife slide, and at a point intermediate its ends to said cutter head, said means pivotally connecting said lever eccentrically to said crank shaft being such that the pivot axis of said lever relative to said crank shaft is fixed to both said lever and said crank shaft, said means pivotally connecting said lever to said cutter head being such that the pivot axis of said lever relative to said head is fixed both to said lever and said head, and said means pivotally connecting said lever to said knife slide including a pressure piece, means supporting the pressure piece on said knife slide for movement relative to said slide solely along an axis parallel to said path of wire feed, and means pivotally connecting said lever to said pressure piece for movement of said lever relative to said pressure piece about a pivot axis fixed both to said lever and said pressure piece, said means supporting said pressure piece on said knife slide including means defining a slide cavity in said slide having a constant cross-sectional size along an axis parallel to said path of wire feed, and said pressure piece being received in said slide cavity and having a complementary cross-sectional shape so as to be restrained to sliding movement relative to said slide along said axis of said cavity.

4,191,079

TEXTILE STRAND CONTROL DEVICE

Alex P. Symborski, Anderson, S.C., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 25, 1978, Ser. No. 937,005
Int. Cl.[2] D01G 1/04
U.S. Cl. 83—347 4 Claims



2. A chopper adapted to cut continuous strand into individual segments comprising:

a rotatable cot roll;

a rotatable cutter roll having a plurality of cutting edges adapted to cut said strand passing between the cutter roll and cot roll; and

a rotatable idler roll adapted to position the strand on at least a portion of the circumferential periphery of the cot roll, the idler roll having

a plurality of substantially parallel, spaced apart cylindrical rods adapted to contact said strand, the rods being positioned along a base circle wherein

D=diameter of the base circle

d=diameter of the rods

S=distance measured along the base circle between centerlines of adjacent rods

and said idler roll is fabricated according to the following parameters

$d \leqq 0.08D$

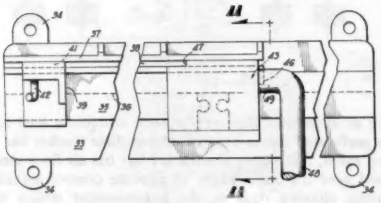
$S \geqq 1.6D$.

4,191,080

APPARATUS FOR PUNCHING STORM SASHES

Lawrence L. Graham, 300 Great Oak Dr., Athens, Ga. 30605

Filed Mar. 9, 1978, Ser. No. 884,893
Int. Cl.[2] B26D 5/10, 7/16
U.S. Cl. 83—467 R 4 Claims



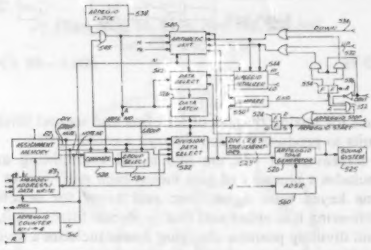
1. An apparatus for fabricating a storm sash comprising a base having an elevated flange extending therealong and forming with the base a horizontal slot, a back rest rising vertically from one side of the base and having a top opening vertical slot formed therein longitudinally at right angles to said horizontal slot, a stop longitudinally adjustably mounted on the base and guidably engaging said horizontal and vertical slots, an opposing punch having a guide element engaging in the vertical slot, said punch having a bottom through passage engaging over said elevated flange and adapted to receive an extruded channel member which is engaged endwise over and along the elevated flange and on said base and held solidly by the flange and base, said vertical slot adapted to receive an accurately precut sash pane between said stop and said punch whereby said pane functions as a gauging element in said apparatus to establish the precise cut off length of said channel member, a vertically reciprocatory punch die means within the punch adapted to engage the channel member to cut off the same and simultaneously form locking tabs thereon at the cut off end of the channel member, and a manual operating member on the punch to move the punch die means relative to said channel member.

4,191,081

SELECTABLE AUTOMATIC ARPEGGIO FOR ELECTRONIC MUSICAL INSTRUMENT

Ralph Deutsch, and Leslie J. Deutsch, both of Sherman Oaks, Calif., assignors to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan

Filed May 11, 1978, Ser. No. 904,733
Int. Cl.[2] G10H 1/00, 5/00
U.S. Cl. 84—1.03 15 Claims



1. In a keyboard operated electronic musical instrument having a plurality of tone generators and memory means for storing a plurality of tone generator control words, means responsive to actuation of the keys on the keyboard for coding a corresponding number of the control words to indicate the note and the associated octave of each actuated key, and means assigning the coded control words to a corresponding number of the tone generators to activate and set the pitch of the tone generators, automatic arpeggio apparatus comprising: means responsive to the activation of a group of keys forming an arpeggio chord for coding a corresponding number of control words in the memory means to indicate each of the notes of the chord, means counting the number of keys forming the chord, means storing the count number of each note in the chord, and means including an arpeggio clock for transferring each of the arpeggio chord note control words in synchronism with the arpeggio clock from the memory means to one of the tone generators sequentially according to said stored count numbers.

4,191,082

KEY RANGE DIVIDING TYPE ELECTRONIC MUSICAL INSTRUMENT

Masahiko Koike, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 11, 1978, Ser. No. 950,328
Claims priority, application Japan, Oct. 27, 1977, 52/128975; Oct. 27, 1977, 52/144426[U]; Oct. 27, 1977, 52/144427[U]; Nov. 1, 1977, 52/146960[U]
Int. Cl.[2] G10H 1/02
U.S. Cl. 84—1.19 6 Claims

1. In an electronic musical instrument comprising:

at least one continuous keyboard having a plurality of keys;

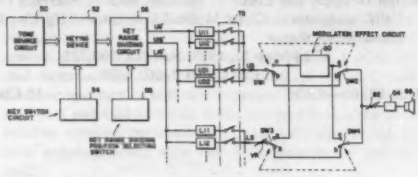
a keyer coupled to said plurality of keys for producing, in response to actuation of a key among said keys, a keyed output of a tone signal having an amplitude envelope and corresponding to note name of said actuated key;

a first filter circuit for coloring keyed tone signals corresponding to keys of a first group;

a second filter circuit having a different characteristic from that of said first filter circuit for coloring keyed tone signals corresponding to keys of a second group other than said first group of keys;

means for changing a dividing position between said first and second groups to vary the keys belonging to each group;

means for transmitting the keyed tone signals of said first and second groups to said first and second filter circuits respectively; and



means for mixing outputs of said first and second filter circuits to produce a sound through a sound system;

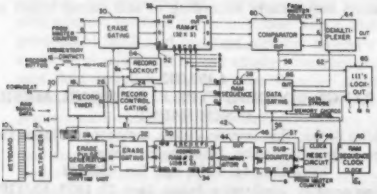
the improvement wherein said signal transmitting means includes a plurality of gate means each receiving at least one keyed tone signal from said keyer for selectively delivering it to either said first or second filter circuit, and said dividing position changing means includes a dividing position selecting switch and a logical circuit connected to said switch for selectively supplying gate conductive signals to said plurality of gate means in accordance with the operation of said selecting switch thereby controlling the conduction of said gate means to change the dividing position between said first and second groups.

4,191,083

METHOD AND APPARATUS FOR MEMORIZING AN ACCOMPANIMENT PASSAGE

Brian N. Wilcox, Jasper; Melvin J. Schroeder, Ferdinand; Billy J. Whittington, and John W. Robinson, both of Jasper, all of Ind., assignors to Kimball International, Inc., Jasper, Ind.

Filed Aug. 2, 1978, Ser. No. 930,394
Int. Cl.[2] G10H *1/00*
U.S. Cl. 84—1.28 **16 Claims**



1. In an electronic organ having a keyboard with playing keys and multiplexer means for scanning said keyboard and developing a multiplexed serial input data stream having key-down signals in time slots corresponding to depressed keys of said keyboard, the improvement being a programmable note pattern generator having a record mode and a playback mode and comprising:

counter means for producing a count sequence in synchronism with the scanning of the keys of said keyboard

a programmable memory,

record means responsive to said input data stream for writing in said memory data corresponding to said keydown signals in said input data stream, said record means being operable when said pattern generator is in the record mode,

playback means for reading the data stored in said memory in the same order in which it was written into said memory, and

comparator means for producing a keydown signal in an output data stream each time there is a match between said count and the data read out of said memory.

16. In an electronic organ having a keyboard, the method of memorizing and then playing back a musical passage comprising:

depressing a plurality of keys on the keyboard,

scanning the keyboard to develop a time division multiplexed serial data stream having a unique time slot for every key of the keyboard and a plurality of signals in said time slots corresponding to the depressed keys,

selectively writing into a programmable memory data corresponding to the location in the data stream of the first occurring keydown signal and then writing into said memory data corresponding to the respective intervals between at least some of the successively occurring keydown signals beginning with said first occurring keydown signal,

reading the data stored in the memory,

converting the data read out of the memory to a serial time division multiplexed data stream having key-down signals in time slots uniquely corresponding to certain keys of the keyboard, and

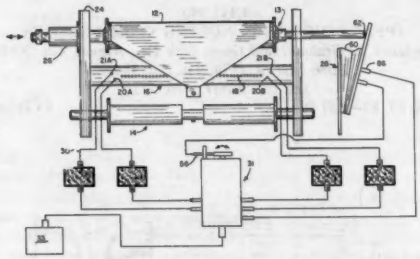
producing audible tones corresponding to said certain keys.

4,191,084

AUTOMATIC TRACKING APPARATUS

Lee Von Gunten, 1515 Crabtree, Arlington Heights, Ill. 60004

Filed Nov. 22, 1978, Ser. No. 962,861
Int. Cl.[2] G10F *5/06*
U.S. Cl. 84—136 **8 Claims**



1. In an automatic alignment system wherein a feed roller passes perforated sheets over an intermediate tracker bar to a take up roller, and where the tracker bar has air flow sensors disposed near it's outer edges to provide control signals to pneumatic aligning devices, the improvement which comprises:

an air flow sensing device having an outer casing member;

multiple cylindrical inlet ports disposed in spaced relation about said casing and connected to receive air flow from the sensors on the tracker bar;

pistons slidably mounted for reciprocal motion in partial sealing contact within said inlet ports for providing motion responsive to the air flow in said ports;

a control arm pivotally mounted at one extremity of said casing and depending therefrom in cam contact with said pistons to provide motion of said control arm responsive to said piston movement;

a projection from said control arm protruding external to

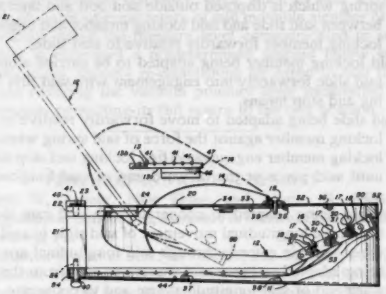
said casing to provide external control to the aligning device corresponding to the position of said control arm.

4,191,085

FOLD-AWAY STRINGED MUSICAL INSTRUMENT

Bradley N. Litwin, R.D. 4, Box 101 B, W. Brattleboro, Vt. 05301

Filed Sep. 25, 1978, Ser. No. 945,311
Int. Cl.[2] G10D *1/08*; G01D *3/00*
U.S. Cl. 84—293 **6 Claims**



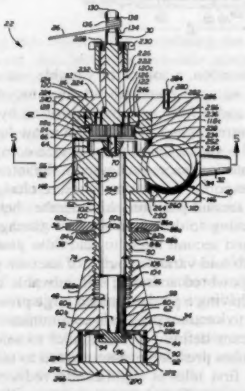
4. A collapsible guitar comprising;
a sound box portion;
a neck portion having connecting means contiguous with said sound box portion, said sound box portion having means for receiving said connecting means in a first position and a second position, said first position having said neck portion stored within said sound box portion and said second position having said neck portion outside of said sound box portion;
a detachable fingerboard end being contiguous with said sound box portion so that said fingerboard end is removed when said neck portion is moved from said first position to said second position.

4,191,086

TUNING DEVICE

Robert J. Spercel, 3214 West 139th St., Cleveland, Ohio 44111

Filed Jan. 5, 1978, Ser. No. 867,164
Int. Cl.[2] G10D *3/14*
U.S. Cl. 84—306 **26 Claims**



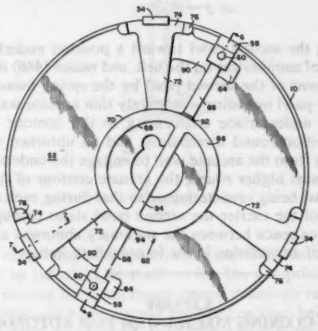
1. A device for tuning a string of a musical instrument to a first pitch and to a second pitch and for easily and repeatably changing between the two pitches, said device comprising a post having first and second end portions, said first end portion being adapted to be connected with the string, drive means for rotating said post, first input means connected with said drive means and rotatable about a first axis to cause said drive means to rotate said post to adjust the tension in the string to a tension corresponding to the first pitch, second input means connected with said drive means and rotatable about a second axis to cause said drive means to rotate said post to adjust the tension in the string from the tension corresponding to the first pitch to a tension corresponding to the second pitch, and adjustable stop means for limiting the extent to which said second input means is operable to adjust the tension in the string to limit the change in tension to a change between the tension corresponding to the first pitch and the tension corresponding to the second pitch.

4,191,087

ROCKET DETENT AND RELEASE MECHANISM

Billy H. Campbell; Edward J. Debona, and William J. Laird, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 14, 1978, Ser. No. 933,312
Int. Cl.[2] F41F *3/04*
U.S. Cl. 89—1.806 **17 Claims**



9. A frangible detent release mechanism comprising, a ring having inner and outer surfaces, radially extending arms from said outer surface that are of equal length and equally spaced about said outer surface of said ring and being made integral with said ring, and a rib integral with said ring and extending diametrically across a diameter of said ring and extending beyond said outer surface of said ring as rib ends, said radially extending arms and said rib ends being weakened relative to said ring, whereby when substantial force is applied to said ring, said ring will be broken away from said arms and said rib ends.

4,191,088

AMMUNITION FEEDER HAVING TWO FEED PAWLS

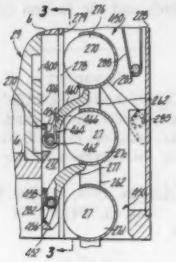
Arthur L. Gardiner, Tustin, and Tomas R. Castillo, Fountain Valley, both of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 10, 1978, Ser. No. 894,663
Int. Cl.[2] F41D *9/02*
U.S. Cl. 89—33 C **1 Claim**

1. In a feeder for delivering ammunition rounds from a belt into the barrel of a gun, said feeder comprising a lower ammunition belt entry station (27*c*) below the level of the gun barrel, an upper ammunition round injection station (27*e*) at the level of the gun barrel, and an intermediate station (27*b*) equidistant from the upper and lower stations; a pawl carrier (272) mounted for vertical reciprocatory motion through a stroke

distance corresponding to the station spacing; and a feed pawl (277) located on the carrier to advance individual rounds of ammunition from the entry station to the intermediate station during each upstroke of the carrier:

the improvement comprising a second pawl (460) swingably mounted on the carrier directly above the feed pawl, whereby said second pawl feeds the last round of ammunition from the intermediate station to the injection station; a stationary abutment in line with the second pawl to limit upward movement of said second pawl and thereby prevent excessive upward movement of the ammunition belt at conclusion of each carrier upstroke; spring means (464)



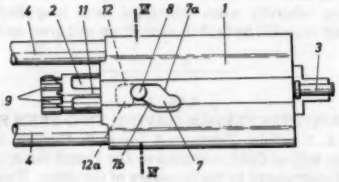
biasing the second pawl toward a position underlying a round of ammunition on the belt, and means (466) limiting movement of the second pawl by the spring means; said second pawl including a relatively thin arcuate wall having an undersurface conforming to the contour of the ammunition round therebelow, and an upturned tip extending from the arcuate wall to engage the undersurface of the next higher round; the arcuate contour of the second pawl being predetermined so that during each downstroke of the carrier the second pawl slides through the clearance space between the stationary abutment and the round of ammunition in the intermediate station.

4,191,089

BREECH-CLOSING MECHANISM FOR AUTOMATIC RIFLE

Ulrich Zedrosser, Steyr, Austria, assignor to Steyr-Daimler-Puch-Aktiengesellschaft, Vienna, Austria

Filed Apr. 10, 1978, Ser. No. 895,270
Claims priority, application Austria, Dec. 22, 1977, 9204/77
Int. Cl.[2] F41D *3/06*
U.S. Cl. 89—181 **2 Claims**



1. In an automatic rifle having a breech chamber and first locking and stop means near said chamber, the provision of a breech-closing mechanism, which comprises

a slide, which is longitudinally movable relative to said chamber and formed with a cam slot,

a bolt, which is longitudinally slidably mounted in said slide and rotatable relative to said slide between first and second rotational positions,

second locking means rigid with said bolt and adapted to cooperate with said first locking and stop means so that a longitudinal movement of said second locking means past said first locking and stop means is permitted in said first and prevented in said second rotational position of said bolt,

a locking member non-rotatably mounted in said slide and extending between said slide and bolt and longitudinally movable relative to said slide and bolt and formed with an angled slot having a longitudinally extending arm and at the forward end of the latter a transverse arm,

a radial cam follower pin rigid with said bolt and extending through said angled slot into said cam slot and

a spring which is disposed outside said bolt and interposed between said slide and said locking member and urges said locking member forwardly relative to said slide,

said locking member being adapted to be carried along by said slide forwardly into engagement with said first locking and stop means,

said slide being adapted to move forwardly relative to said locking member against the force of said spring when said locking member engages said first locking and stop means until said pin is at the forward end of said longitudinal arm,

said pin being adapted to cooperate with said cam slot to transmit a longitudinal movement of said slide to said bolt when said pin extends through said longitudinal arm and being adapted to enter said transverse arm from the forward end of said longitudinal arm and to cooperate with said cam slot so as to move said bolt between said first and second positions in response to a longitudinal movement of said slide when said pin extends through said transverse arm

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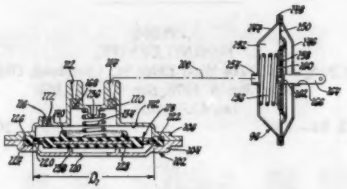
4,191,090

VACUUM TOGGLE

Ronald D. Freiberger, Kokomo, and Richard D. Reprogle, Greentown, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 17, 1978, Ser. No. 896,685
Int. Cl.[2] F15B *13/042*
U.S. Cl. 91—52 **2 Claims**



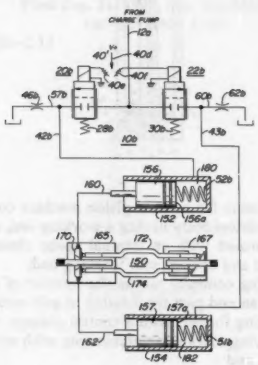
1. In combination, a source of variable vacuum pressure, a two-position vacuum-powered actuator movable between a rest position and a fully energized position by an increase of vacuum pressure applied thereto from a low level to a moderate level, and a vacuum switching device comprising: a housing with an interior space; a member in the interior space being movable in response to vacuum pressure changes from a first position to a second position, said member being cooperative with said housing to define an air flow passage; said housing having first and second inlets to said flow passage connected respectively to said variable source of vacuum pressure and to the vacuum powered actuator; said movable member in said first position having a predetermined large pressure responsive area exposed to vacuum pressures communicated through said first inlet, means defining a bleed inlet to said flow passage whereby vacuum pressure communicated to said flow passage through said first inlet is significantly reduced by air bleed resulting in an insufficient vacuum transmittal through said second inlet to said actuator to move it from its rest position until the vacuum pressure communicated to said first inlet substantially exceeds said moderate level whereby a predeter-

mined high vacuum pressure communicated to said first inlet, even as reduced by air bleed, is sufficient to act on said large pressure responsive area to cause movement of said movable member into said second position; means operably associated with said housing and said movable member to prevent air bleed when said movable member is in its second position, thereby effectively increasing the vacuum pressure level communicated to said actuator sufficient to cause full movement from its rest position to its energized position; said air bleed preventing means simultaneously reducing the area of said movable member exposed to vacuum pressure to a predetermined small pressure responsive area when in said second position to thereby permit return of said movable member to its first position when the pressure level communicated to said first inlet is decreased a predetermined amount below said moderate level, thereby re-establishing air bleed to said first inlet and reducing the vacuum pressure level transmitted to said actuator permitting its full return to the rest position.

4,191,091
FEATHERING VALVE ASSEMBLY

Kenneth W. Zeuner, New Hope, and Alonzo B. Jarman, Wrightstown, both of Pa., assignors to Control Concepts, Inc., Newtown, Pa.

Continuation-in-part of Ser. No. 705,920, Jul. 16, 1976, Pat. No. 4,126,293. This application Nov. 13, 1978, Ser. No. 958,349
The portion of the term of this patent subsequent to Nov. 21, 1995, has been disclaimed.
Int. Cl.² F15B *13/06, 13/043*
U.S. Cl. 91—52 **10 Claims**



1. A feathering valve system for modulating the fluid inflow to first and second chambers of a movable assembly having biasing means comprising:

first and second electrohydraulically operated normally closed pilot valve assemblies respectively having first and second plug means movable between (1) valve normally closed states seating in and closing respective first and second pilot orifices for preventing any substantial flow of fluid through respective first and second pilot orifices and (2) valve open states, said first and second plug means being individually operated and not mechanically connected to each other,

controller means electrically coupled to said pilot valve assemblies for applying a predetermined value electrical signal for actuating a pilot valve assembly to an open position related to the value of said signal;

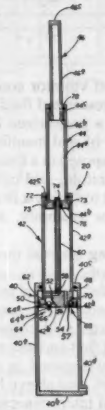
pilot source means for applying fluid under a substantially constant pilot pressure under said first and second plug means through said pilot orifices, and

first and second conduit means for providing modulating fluid flow from above the first or second plug means of an actuated valve assembly to a respective chamber tending to close the respective plug means thereby producing negative feedback, whereby said movable assembly moves against said biasing means to a position which is a function of the actuating signal value.

4,191,092
TELESCOPIC RAM

Stanley E. Farmer, Troutdale, Oreg., assignor to Cascade Corporation, Portland, Oreg.

Filed Nov. 16, 1977, Ser. No. 852,108
Int. Cl.² F15B *11/18;* F01B *7/20*
U.S. Cl. 91—189 R **4 Claims**



1. A three-stage, fluid-actuated, extensible-contractible device for an industrial lift truck or the like comprising

first, second, third and fourth nested, relatively reciprocable sections, said first, second and third sections being extensible from said second, third and fourth sections, respectively,

port means for introducing and exhausting pressure fluid to extend and contract said device, respectively,

means on said first, second and third sections defining working surface areas on which pressure fluid acts to extend said sections, said area on said first section being less than that on said second section, and said area on said second section being less than that on said third section, and

fluid-flow control means within said device for controlling the distribution of fluid therein, said control means including first, second and third passage means provided within said third section, said first passage means accommodating throughout length-change in said device fluid communication between said second and fourth sections, said second passage means accommodating throughout length-change in said device fluid communication between said third and fourth sections, and said third passage means accommodating throughout length-change in said device communication between opposite end portions in said fourth section,

said second passage means causing said working surface area on said second section to be exposed, under all operating conditions, directly to the same pressure fluid acting on said working surface area on said third section,

said control means, with pressure fluid supplied to said port means at a substantially constant rate, and in cooperation with said areas, producing a substantially uniform overall extension speed for said device.

4,191,093

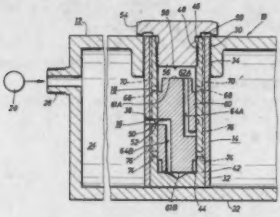
CONCRETE STRIKE-OFF VIBRATOR

Marshall F. Compton, 114 Brandon, Conroe, Tex. 77301

Filed Sep. 19, 1977, Ser. No. 834,297

Int. Cl.[2] F01L *21/02*; F16J *11/02*

U.S. Cl. 91—234 **7 Claims**



1. A concrete strike-off vibrator comprising:

a manifold having a presurrized fluid inlet adapted to permit the introduction of a pressurized fluid into a volume defined in the interior of said manifold;

a cylinder assembly disposed in a force-transmitting relationship within said manifold, said cylinder assembly including a piston adapted to define a first and a second volume within said cylinder assembly, said cylinder assembly comprising:

a barrel member having internal threads disposed adjacent the upper end thereof;

a flanged cap adapted for threaded interconnection with said barrel, said barrel and said cap cooperating to define an enclosed space wherein said piston is moveably disposed and from which said first and second volumes are defined;

a sleeve concentrically disposed in a close-fitting relationship about said barrel, said sleeve having external threads adapted for threaded interconnection with said manifold;

intake means for introducing a pressurized fluid from said interior volume of said manifold into said first and second volumes of said cylinder assembly; and,

exhaust means isolated from said intake means and from said interior volume of said manifold for venting said first and said second volumes of said cylinder assembly;

said piston being displaceable within said cylinder assembly in response to the introduction of pressurized fluid into said first and second volumes of said cylinder assembly to generate vibratory forces transmissible to said manifold.

4,191,094

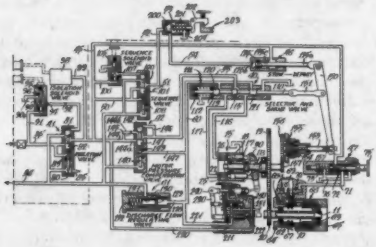
POWER DRIVE UNIT

Robert V. Flippo, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Apr. 26, 1978, Ser. No. 900,313

Int. Cl.[2] F01B *3/06*; F04B *1/30*; F16D *31/02*

U.S. Cl. 91—506 **10 Claims**



1. A power drive unit for imparting two-directional drive to a mechanism with different torque demands at different times in the cycle of operation with operation at the maximum speed possible for each load condition at a constant hydraulic flow through a bi-directional motor with displacement-varying means, comprising, in addition to said motor, a control cylinder having a piston connected to said displacement-varying means, a first conduit connected to said motor and including a valve for controlling the direction of flow to the motor, a second circuit connected to said control cylinder including servo valve means for controlling the position of the piston in the cylinder to control the position of said displacement-varying means, and motor torque sensing means including means for sensing the pressure drop across the motor without waste of energy in the hyraulic system and operable in both directions of motor rotation for positioning of said servo valve means.

4,191,095

HOLLOW PISTON FOR HYDROSTATIC MACHINES

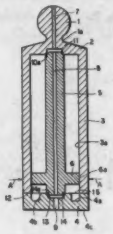
Walter Heyl, Johannesburg, Fed. Rep. of Germany, assignor to Linde AG, Höllriegelskreuth, Fed. Rep. of Germany

Filed Nov. 23, 1977, Ser. No. 854,053

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1976, 2653868

Int. Cl.[2] F15B *21/04*; F16K *1/00, 1/08*

U.S. Cl. 92—78 **6 Claims**



1. A hollow piston for an axial-piston machine comprising:

a hollow cylindrical body having a working end, a reaction end, and formed with an internal space closed at said reaction end and open at said working end;

a post extending centrally within the interior of said body and having an end part terminating at said working end, said post being formed with a central passage, said reaction end having a bore communicating with said passage in said post; and

a cover secured to said body at said working end, said cover having a part juxtaposed with said end part of said post, one of said parts being provided with a conical surface and the other of said parts having an edge engaging said conical surface, said cover having a further passage communicating with said central passage.

4,191,096

TIME DELAY ASSEMBLY

Benjamin C. Benjamin, Flint, Mich., assignor to Schmelzer Corporation, Durand, Mich.

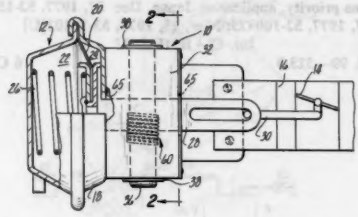
Filed Nov. 28, 1977, Ser. No. 855,360

Int. Cl.[2] F15B *15/22*; F01B *29/00*

U.S. Cl. 92—143 **7 Claims**

1. A time delay device comprising, a housing, a shaft rotatably mounted in said housing, a plate member mounted on said shaft for rotation therewith, a wall member disposed in said housing at one side of said plate member, said shaft being rotatable relative to said wall member, a layer of viscous material adhering to adjacent surfaces of said plate and wall member to retard rotation of said housing, a control member movable in opposite directions, a one-way clutch including a coil spring wound on said shaft for rotation relative to said shaft in

one direction and rotation therewith in the other direction and connecting said shaft to said control member for movement of said control member independently of said shaft in one direction and with said shaft in the opposite direction, said control



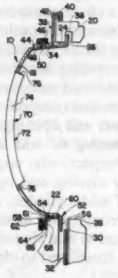
member forming part of a vacuum motor and being movable in one direction at a delayed rate and in the other direction at a normal rate, said housing being supported on the exterior of said vacuum motor.

4,191,097

AIR DEFLECTOR FOR MOTOR VEHICLES

Don L. Groen, 1346 Blackhawk Trail - W, Jacksonville, Fla. 32225

Filed Sep. 11, 1978, Ser. No. 940,954
Int. Cl.² B60J 1/20
U.S. Cl. 98—2.12 **5 Claims**



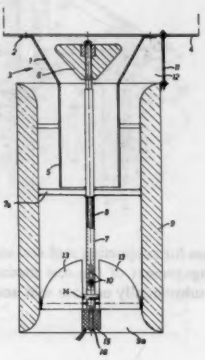
1. An air deflector for motor vehicles having windows and frames therefor comprising a semiflexible sheet having a leading edge, a trailing edge, an upper edge, and a lower edge; first means for securing said upper edge to an upper edge of said window frame; second means for securing said lower edge to an lower edge of said window frame; and means for adjustably deflecting air, said air deflecting means disposed on said trailing edge, said semi-flexible sheet bowing outwardly from said motor vehicles when secured thereto, wherein said first securing means comprises substantially "L" shaped folded portion provided in said semi-flexible sheet adjacent said upper edge thereof, said substantially "L" shaped folded portion engaging an upper window slot provided by said frame, a bracket for engaging said window frame, said bracket affixed to said sheet, said bracket and said substantially "L" shaped folded portion partially encircling said frame and securing said upper edge of said semi-flexible sheet adjacent thereto, wherein said adjustable deflection means comprises a portion of said sheet adjacent said trailing edge thereof being partially severed by pair of spaced apart slits, said slits extending inwardly from said trailing edge, said portion between said slits being positionable in plane substantially transverse to said semi-flexible sheet.

4,191,098

NOZZLE FOR AIR CONDITIONING UNITS

Dietfried Gersch, Giessen, Fed. Rep. of Germany, assignor to Kessler & Luch GmbH, Giessen, Fed. Rep. of Germany

Filed May 8, 1978, Ser. No. 903,404
Claims priority, application Fed. Rep. of Germany, May 21, 1977, 2723006
Int. Cl.² F24F 13/06, 13/08
U.S. Cl. 98—40 N **7 Claims**



2. An air nozzle as outlet element of an air conducting tube of air conditioning units, said nozzle comprising:

(a) a primary nozzle in the form of a hollow cone fixedly mounted with its base on the air conducting tube;

(b) a secondary nozzle in the form of a sleeve, said sleeve having a larger diameter than the small end of the hollow cone and being arranged concentrically to the hollow cone, one end of the sleeve facing the air conducting tube but being spaced therefrom so as to define an annular opening between the outside of the hollow cone and the inner wall of the sleeve, the other end of the sleeve forming a blow-out end;

(c) a truncated cone arranged coaxially on the inside of the hollow cone so as to define an annular opening between the outside of said truncated cone and the inner wall of said hollow cone;

(d) means for displacing said truncated cone in axial direction comprising a pipe mounted stationarily and concentrically in said sleeve and an axially displaceable rod guided in said pipe, the truncated cone being mounted on the front end of said rod;

(e) blades at the blow-out end of the sleeve extending in radial direction between the inner wall of the sleeve and the outer wall of the pipe; said blades being supported on pins in the walls of the sleeve and the pipe so as to be pivotable in different directions; and

(f) means for angularly pivoting all blades simultaneously.

4,191,099

SEALING ARRANGEMENT FOR CHIMNEYS WITH AN ANNULAR PRESSURIZED SPACE

Victor H. Strahl, Kansas City, Mo., assignor to Pullman Incorporated, Chicago, Ill.

Filed Mar. 23, 1978, Ser. No. 889,456
Int. Cl.² F23L 17/02
U.S. Cl. 98—60 **10 Claims**

1. In a chimney having an outer tubular shell the improvement comprising:

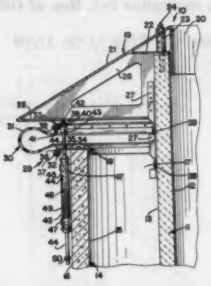
an inner tubular liner spaced and in axial alignment with said tubular shell to provide an annular space therebetween,

an upper hood cover member supported on said inner tubular liner above said annular space,

a flexible boot-like member having first and second annular

circumferential edges, said first edge connected to said outer tubular shell,

seal means for sealingly engaging said second edge means of said boot-like member, and



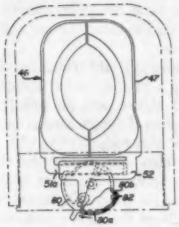
biasing means for supporting said seal means for sealing and sliding engagement of the seal means against said hood cover to substantially enclose said annular space.

4,191,100

BREWING APPARATUS FOR COFFEE AND THE LIKE

Vincent G. Marotta, Shaker Heights, Ohio, assignor to North American Systems, Inc., Bedford Heights, Ohio

Filed Nov. 15, 1976, Ser. No. 741,621
Int. Cl.[2] A47J *31/10*
U.S. Cl. 99—299 **15 Claims**



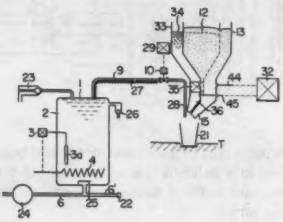
1. An infusion apparatus for brewing coffee or the like comprising a receptacle comprising an infusion chamber for receiving infusion material to be infused into a liquid as the latter flows through the chamber from an inlet zone to an outlet zone, and means for changing the size of said chamber laterally of the path from said inlet zone to said outlet zone to change for a given quantity of infusion material in said chamber the thickness of infusion material along the path through which the liquid must flow, said receptacle having an outer side wall, a support portion extending outwardly from said side wall, said means for changing the size of said chamber comprising an actuating mechanism on said support portion, and a cover member on said support portion movable from a position covering said actuating mechanism on said support portion to a position exposing said actuating mechanism, and means for latching said cover in a closed position.

4,191,101

APPARATUS FOR PREPARING A CUP OF HOT DRINK

Akira Ogawa, Mishima; Toyoaki Masuda, and Osamu Miura, both of Numazu, all of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1978, Ser. No. 971,075
Claims priority, application Japan, Dec. 21, 1977, 52-154104; Dec. 27, 1977, 52-160823; Mar. 15, 1978, 53-33101[U]
Int. Cl.[2] B01F *3/12*
U.S. Cl. 99—323.3 **6 Claims**



1. Apparatus for preparing a cup of hot drink comprising a tank for storing hot water, said tank being provided with means for constantly controlling temperature of the hot water contained therein and means for constantly controlling pressure of said hot water; a pipe having one end communicating with said tank for feeding said hot water from said tank; a nozzle connected to said pipe through valve means; a timer connected to said valve means for controlling the operation thereof; a hopper filled with a raw material for preparing said hot drink; powder measuring means connected to the bottom opening of said hopper; a chute connected to the bottom end of said powder measuring means, the outlet opening of said chute being arranged near the outlet of said nozzle; and means for supporting a cup for preparing hot drink beneath said outlet opening of said chute and said outlet opening of said nozzle, said powder measuring means comprising a powder measuring cylinder, upper and lower end openings of which are aligned with the lower end opening of said hopper and upper end opening of said chute, respectively, upper and lower shutters operated for alternately closing and opening said upper and lower end openings of said cylinder, and a rotary disc for driving said shutters through link members, one end thereof being pivotably connected to said shutters respectively and the other end thereof being connected to circumferentially spaced apart points of said disc.

4,191,102

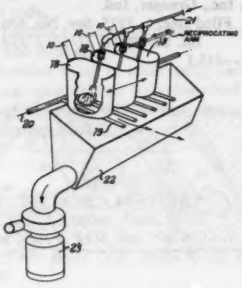
EGG-DESHELLING APPARATUS

Cecil J. Cope, Berkshire, England, assignor to Cope Whelon and Company, Limited, Reading, England

Division of Ser. No. 725,768, Sep. 23, 1976, abandoned. This application Apr. 18, 1978, Ser. No. 897,455
Int. Cl.[2] A23N *5/00*; A47J *43/14*
U.S. Cl. 99—580 **3 Claims**

1. Egg-deshelling apparatus for deshelling hard boiled eggs, comprising a plurality of open-top and open-bottom compartments each of which is adapted to receive an individual egg to be deshelled, each of said compartments comprising a continuous closed wall having curved surfaces which enclose a substantially oval area, said plurality of closed walls being interconnected to one another with the longitudinal axes of said oval areas being disposed substantially parallel to one another, means for feeding a plurality of hard boiled eggs to the open tops of said plurality of compartments respectively to deposit one of said eggs in each compartment, means located below the open bottoms of said compartments for supporting said eggs in their respective compartments, the longitudinal axis of each egg being oriented substantially along the longitudinal axis of the oval compartment area in which said egg is supported,

means for reciprocating said interconnected compartments in a direction transverse to the longitudinal axes of said oval areas to cause the opposing interior curved surfaces of said continuous closed walls to apply a plurality of blows to the sides of the



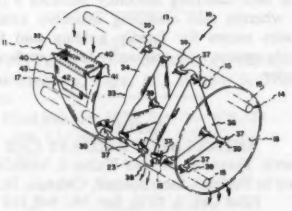
hard boiled eggs in said compartments, thereby to shatter the shells of said eggs, means for washing the broken shells out of said compartments, and release means for moving said supporting means away from the open bottoms of said compartments to discharge the deshelled eggs from said compartments.

4,191,103

APPARATUS FOR EXTRACTING JUICE FROM POMACE

Dale E. Wettlaufer, East Aurora, N.Y., assignor to Terrier Machine Corporation, Buffalo, N.Y.

Filed Aug. 10, 1977, Ser. No. 823,221
Int. Cl.[2] B30B *9/06*
U.S. Cl. 100—110 **11 Claims**



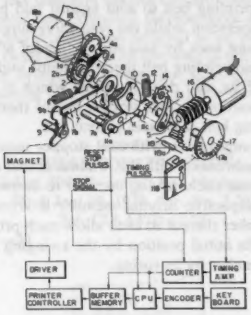
1. In a juice extractor adapted to separate the juice of a pomace from the pulp thereof, the improvement comprising: a bearing member having a bearing surface; an elongated flexible sleeve positioned adjacent said bearing surface and formed of a foraminous material permeable to said juice but substantially impermeable to said pulp, said sleeve having an entrance end adapted to receive said pomace and having an exit end through which said pulp may be discharged; roller means mounted for movement relative to said sleeve and arranged to press a proximate portion of said sleeve against said bearing surface; and drive means coupled to said roller means for moving said roller means lengthwise along said sleeve for causing said roller means to squeeze juice from said pomace through said sleeve and for causing said roller means to advance said pomace from said entrance end toward said exit end.

4,191,104

PRINTER HAVING SWINGABLE PRINTING CHARACTER SUPPORTING ENDLESS BELTS

Katsuhiko Okabe, Tokorozawa, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed Dec. 21, 1977, Ser. No. 862,831
Claims priority, application Japan, Dec. 24, 1976, 51-157184; Dec. 24, 1976, 51-157185; Dec. 27, 1976, 51-178164[U]
Int. Cl.[2] B41J *1/20*
U.S. Cl. 101—93.14 **4 Claims**



1. Printer having a plurality of swingable and rotatable printing character bearing endless belts cooperating with a platen for the printing operation, wherein the improvement comprises:

a swingable supporting member for supporting each said printing belt so as to rotate said printing belt around itself on said supporting member;

a driving shaft for transmitting the driving force to the respective printing belt for the rotation thereof around itself, one of the plurality of printing characters born on the periphery of each of said printing belt being selected for the desired printing operation by virtue of the rotation of said printing belt around itself while said printing belt is swung toward said platen for effecting the printing operation by virtue of the swinging movement of said supporting member;

signal emitting means rotated in synchronism with said driving shaft;

signal receiving means cooperating with said signal emitting means so as to issue an electrical signal each time one cycle of the printing operation is effected by the rotation of said driving shaft, said electrical signal being applied to a control circuit for controlling the starting and stopping of the operation of said printer;

a detecting disc rotated in synchronism with said driving shaft and provided with a plurality of slits around the rotational axis thereof corresponding in number to that of the characters on the respective printing belt;

a detecting device cooperating with said slits in said detecting disc for issuing character synchronizing timing signals in timed relationship to the positions of the respective moving characters on each printing belt as it rotates around itself, said timing signals being applied to said control circuit for permitting a desired character of said plurality of characters on each printing belt to be selected for the printing operation during the rotation of the respective printing belt;

a driving member for swinging said supporting member toward said platen until shortly before the abutment of said belt on said supporting member against said platen, each said driving member cooperating with a select member adapted to be actuated to release said driving member for the driving of said supporting member upon issuance of a printing signal from said control circuit, said supporting member being further swung by the inertia thereof

after disengagement from said driving member to cause said belt to abut against said platen for the printing operation, said supporting member being immediately returned by virtue of a spring cooperating with said supporting member so as to swing said belt apart from said platen;

stopper means for limiting the swinging movement of each said driving member to a position whereby said supporting member is swung further by virtue of the inertia thereof against the action of said spring after said driving member is stopped by said stopper means thereby permitting said printing belt to abut against said platen for the printing operation while the respective supporting member is swung back by said spring thereof after the abutment of said printing belt thereof against said platen so as to be held by said driving means which is held at said stopped position by said stopper means thereby clearing said printing belt from said platen; and,

reset means engageable with said stopper means and actuated in synchronism with the rotation of said driving shaft so as to cause each driving member to be swung back so that the respective driving member is arrested by said select member thereof so as to allow each printing belt to return to its initial position by the swinging of said supporting member by its spring.

4,191,105

PRINTING APPARATUS

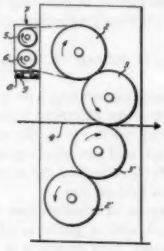
Jarl E. S. I. Ohlsson, St-Julien en Genevois, France, assignor to Sisenca S.A., Geneva, Switzerland

Filed Feb. 6, 1978, Ser. No. 875,624

Claims priority, application Switzerland, Feb. 7, 1977, 1436/77

Int. Cl.[2] B41F *1/28*

U.S. Cl. 101—415.1 **2 Claims**



1. A printing apparatus comprising at least one plate cylinder, at least one printing plate provided with printing regions, and means for setting in position and for automatically fixing at least one said printing plate around the cylinder, the plate cylinder being non-magnetic and comprising an axial slot and the printing plate having at each of its ends a fixing flange to be introduced into said slot, the apparatus also comprising means for storing the plate, means for transferring the plate from the storage means to a position around the plate cylinder, and positioning means disposed between the storage means and the cylinder, the storage means comprising a feed cylinder around which the plate is wound, the diameter of the feed cylinder being less than the diameter of the plate cylinder, a receiving cylinder for receiving the plate after use thereof, and a movable frame on which the feed cylinder and the receiving cylinder are rotatably mounted.

4,191,106

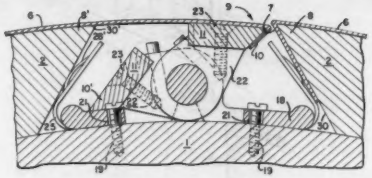
PRINTING PLATE CLAMPING ASSEMBLY

Rudy Fermi, South Bend; John Pickard, Elkhart; Alex Kocsis, Granger; David Bratton, Mishawaka, all of Ind., and Gerald Kasner, Union, Mich., assignors to K and Manufacturing Company, Inc., Granger, Ind.

Filed Dec. 1, 1975, Ser. No. 636,454

Int. Cl.[2] B41F *27/12, 27/14*

U.S. Cl. 101—415.1 **68 Claims**



1. Apparatus for detachably holding thin flexible printing plates in position on a cylindrically shaped press cylinder comprising:

shim means configured to accurately radially position a printing plate with respect to the cylindrical outwardly facing surface of the press cylinder,

shim attaching means for attaching said shim means to the press cylinder with respective oppositely circumferentially facing shim edge portions being spaced from one another to form a gap there between,

a clamping assembly for releasably clamping a first plate edge portion of said printing plate to said press cylinder with said printing plate engaged against an outwardly facing plate supporting surface of said shim means,

and clamping assembly attaching means for detachably attaching said clamping assembly to said press cylinder, said clamping assembly attaching means being separate from said shim attaching means,

said shim means and clamping assembly being dimensioned and configured such that said clamping assembly fits within said gap without protruding radially outwardly beyond the radial outward extent of said shim means when in an operating position clamped to said press cylinder,

wherein said clamping assembly includes a base member, and wherein said clamping assembly attaching means includes means for fixedly holding said base member directly against said outwardly facing surface of the press cylinder.

4,191,107

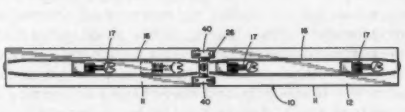
ARTICULATED RAILWAY CAR

Ray L. Ferris, Thornton, Ill., and Walter J. Marulic, Gary, Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed Oct. 2, 1978, Ser. No. 948,116

Int. Cl.[2] B61F *3/08, 5/14*

U.S. Cl. 105—4 R **9 Claims**



1. In an articulated railway car including a pair of car body units arranged in end to end relation,

a truck underlying adjacent ends at said body units for supporting the same and including a pair of wheeled axles positioned respectively under the adjacent ends of said units,

means projecting outwardly from the adjacent ends of said body units and being interconnected to provide a vertical

articulated connection for said car; the improvement of a side bearing arrangement supported on the adjacent ends of said body units on opposite sides of said articulated connection, said arrangement comprising,

first male bearing element projecting outwardly from one of said adjacent ends,

second female bearing elements projecting outwardly from the other of said adjacent ends,

said bearing elements being in telescoping sliding engagement with one another and interconnected to prevent rotation of one body unit with respect to the other body unit about a longitudinal axis of said car.

4,191,108

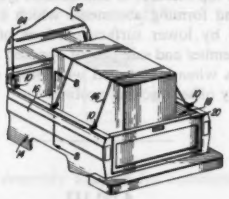
TIE DOWN ANCHOR

Jeffery C. Jones, Rte. 2, Dunlap, Tenn. 37327

Filed Mar. 6, 1978, Ser. No. 883,674

Int. Cl.² A62B *35/00*; B60P *7/06*; B61D *45/00*; F16B *13/08*

U.S. Cl. 410—110 **5 Claims**



1. A device for use with a hollow sidewall of a bed of a pick-up truck having a stake opening through said sidewall, said device comprising:

(a) first and second side portions joined at one end capable of being inserted in said stake opening,

(b) a projection on each of said side portions, said projections extending a distance away from said side portions to engage said sidewall of said bed to prevent removal of said device from said stake hole, and

(c) extension means associated with each of said first and second side portions to permit attachment of an object thereto.

4,191,109

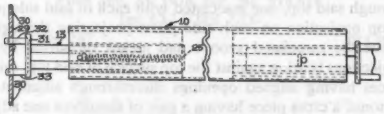
END FITTING FOR CARGO CONTAINERS

Chester H. Wickenberg, Elgin, Ill., assignor to Transco Inc., Chicago, Ill.

Filed Feb. 16, 1978, Ser. No. 878,326

Int. Cl.² B61D *17/08*; B60P *7/14*

U.S. Cl. 410—149 **3 Claims**



1. An end fitting for a cargo retainer such as a crossbar cooperating with parallel belt rails mounted on opposite walls of a freight vehicle providing side-by-side vertically extending slots formed throughout their longitudinal length comprising

(a) a crossbar in the form of a tubular member extending across the vehicle between the belt rails with said crossbar reversible through 180° about its longitudinal axis,

(b) a coupling means on each end of said crossbar with one of said coupling means yieldably biased endwise of the bar,

(c) said coupling means providing a hand gripping plate extending transversely of the longitudinal axis and to either side of the horizontal axis of the crossbar,

(d) a pair of spaced flanges extending outwardly of said hand gripping plate parallel to the longitudinal axis of said bar and adapted to be inserted into the vertical slots formed in the belt rails for connecting said crossbar thereto,

(e) oblate ellipsoid shaped means on the outermost ends of said flanges for aiding in camming said ends into the slots provided by the belt rails, and

(f) a retaining tongue extending between said flanges and of a length less than said flanges and disposed along a transverse center line extending therebetween and in the mid plane of the crossbar and adapted to be yieldably biased into full facial contact with one wall of the belt rail which faces the crossbar between the slots provided therein while spacing said hand gripping plate therefrom.

4,191,110

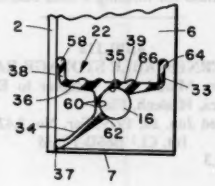
SHELF CONSTRUCTION

Edward O. Klukos, 3284 Roosevelt Rd., Muskegon, Mich. 49441

Filed Jan. 10, 1979, Ser. No. 2,243

Int. Cl.² A47B *17/00*

U.S. Cl. 108—27 **22 Claims**



1. A shelf construction for storing articles for mounting between a pair of vertically extending end supports mounted in spaced parallel relationship to a rear support surface and including a plurality of vertically spaced, horizontally extending support members extending between the end supports, said construction comprising:

at least one integrated shelf and bracket including means defining a support surface having a forwardly facing socket formed in said integral shelf and bracket for mounting to a support member and rearwardly extending means for engaging the rear support surface for forcibly compressing the socket into lockable engagement with the support member.

4,191,111

BENCH FOLDING LEG AND BRACE STRUCTURE

Raymond L. Emmert, 8112 NW. 19, Oklahoma City, Okla. 73127

Continuation of Ser. No. 870,159, Jan. 17, 1978, abandoned. This application Mar. 9, 1979, Ser. No. 19,210

Int. Cl.² A47B *3/00*

U.S. Cl. 108—132 **11 Claims**

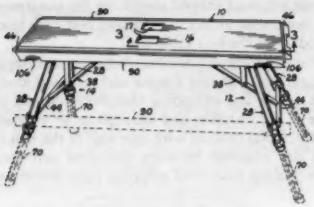
1. A collapsible bench or horizontal support having a top, comprising:

leg means including at least one leg extending longitudinally of the underside of said top and pivotally connected at one end portion to one end portion of said underside for vertical pivoting movement of the leg other end portion about a horizontal axis toward and away from said underside;

brace rod means including an elongated rod extending longitudinally of said underside and pivotally connected at one end portion to said underside in spaced relation with respect to the connected end of said leg for vertical pivoting movement of the rod other end portion about a horizontal axis toward and away from said underside,

said rod other end portion having an aperture;

link and bracket means interconnecting said leg means and said brace rod means with each other and with said underside for simultaneously pivoting said other end portions of said leg and said brace rod in opposing directions toward a downwardly converging juxtaposed position in response



to movement of said rod other end portion away from said underside; and,

locking means including an outstanding lock pin secured to said leg other end portion for entering the rod aperture and connecting said leg with said brace rod at their convergent position for forming a load bearing structure.

4,191,112

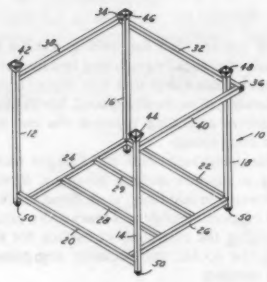
INTERNESTABLE STORAGE RACK

Felipe Maldonado, Miami, Fla., assignor to Equipment Company of America, Hialeah, Fla.

Filed Jan. 10, 1979, Ser. No. 2,420

Int. Cl.[2] B65D *19/38*

U.S. Cl. 108—53.3 **6 Claims**



1. A rigid internestable storage rack for accommodating the storage of goods and which is adapted for transport by a fork lift truck or the like comprising,

a series of four vertically extending support posts, with two posts being located at the front of the rack and with two posts being located at the rear of the rack, with the two posts at the rear being closer to one another than the two posts at the front of the rack,

horizontally extending front and rear lower brace members, said front lower brace member being located between and abutting the opposing surfaces of said front support posts and being secured thereto, said rear lower brace member being located between and abutting the opposing surfaces of said rear support posts and being secured thereto, said front lower brace member being longer than said rear lower brace member,

a pair of horizontally extending and parallel opposed lower cross brace members, each lower cross brace member having one end abutting one of the rear support posts and being secured thereto, with each such lower cross brace member extending towards the front of the rack where it perpendicularly intersects, abuts and is secured to said front lower brace member, each of said lower cross brace members being of generally the same length,

a rear horizontally extending upper brace member having intermediate portions secured to the rear surfaces of aid rear support posts, with the end portions of said rear upper brace member extending laterally outwardly beyond said rear support posts,

a pair of opposed horizontally extending upper cross brace members which are parallel and of the same length, each upper cross brace member having one end abutting and secured to one of the end portions of said rear upper brace member, with each upper cross brace member extending forwardly towards the front of the rack where it perpendicularly intersects, abuts and is secured to one of the front support posts,

said upper rear brace member and said pair of opposed upper cross brace members being positioned externally of said rear support posts, and

a socket located on top of each of said vertical support posts, with the top surfaces of said sockets lying in a horizontal plane and forming abutments which are adapted to be engaged by lower surface portions of said upper rear brace member and said pair of opposed upper cross brace members when internested with other similar racks in a vertically offset stacking posture.

4,191,113

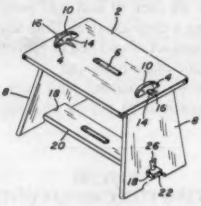
TABLE OR STOOL OF SEPARABLE COMPONENTS

Carl G. Hogberg, 26 Captains Cove La., North Chatham, Mass. 02650

Filed Feb. 23, 1978, Ser. No. 880,638

Int. Cl.[2] A47C *4/02*

U.S. Cl. 108—157 **4 Claims**

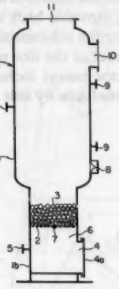


1. A piece of furniture comprising a top having a bottom surface, a pair of side pieces each having a surface engaging said bottom surface of said top to support said top, means for holding the top of said side pieces in fixed relationship with said top, said means including a pair of transverse grooves through said top, one associated with each of said side pieces, a top projection on each side piece projecting through and above the associated groove and means supported by each projections bearing against the top surface of said top, said side pieces having aligned openings therethrough adjacent their bottoms, a cross piece having a pair of shoulders one adjacent each end adapted to bear against the associated side piece and a portion extending beyond each shoulder through and beyond each of said aligned openings, and means supported by each of said portions of said crosspiece bearing against the outer surface of said side, said side pieces diverging downwardly and outwardly from said top, the distance between said shoulders being greater than the distance which would permit an easy fit of said top projections into said grooves so that said crosspiece is slightly bent when the top projections of said side pieces are inserted through said top thus providing an outwardly directed force on the tops of said side pieces in the grooves whereby the parts of said furniture are held rigid in assembly.

4,191,114
FURNACE ADAPTED FOR BURNING CITY-, INDUSTRIAL AND THE LIKE WASTES

Shigeru Saitoh, and Noboru Suzuki, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1977, Ser. No. 863,664
Claims priority, application Japan, Dec. 24, 1976, 51/155070; Feb. 10, 1977, 52/012976
Int. Cl.² F23G 5/00
U.S. Cl. 110—248 8 Claims



1. A furnace assembly adapted for combustion of wastes comprising:

wall means defining an enclosed space;

a perforated grating positioned in said enclosed space to divide said space into an upper combustion chamber and a lower chamber;

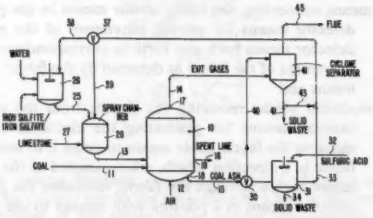
mounting means for pivotally connecting said grating to said wall means so that said grating is movable between a first, substantially horizontal, position, and a second position angularly spaced from said first position, said grating in said first position receiving a mass of mineral particles acting as a provisional, stationary air-permeable furnace bed for receiving wastes to be combusted; and

means for moving said grate from said first to said second position so that said grate is tilted thereby dumping the mass of mineral particles and combustion wastes into said lower chamber.

4,191,115
CARBONACEOUS FUEL COMBUSTION WITH IMPROVED DESULFURIZATION

Ralph T. Yang, Middle Island, and Ming-shing Shen, Rocky Point, both of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 23, 1978, Ser. No. 918,618
Int. Cl.² F23B 7/00
U.S. Cl. 110—347 39 Claims



1. A method for desulfurization in the combustion of sulfur-containing carbonaceous fuel comprising, burning said carbonaceous fuel in the presence of limestone, said limestone being coated with a metal oxide.

4,191,116
INJECTION PLANTING TOOL

C. Jay Allison, Jr., and Kirk Willis, both of Chehalis, Wash., assignors to Illinois Tool Works Inc., Chicago, Ill.

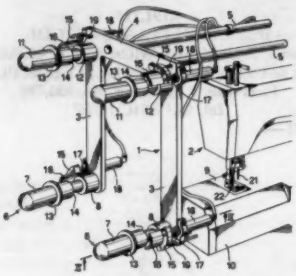
Filed Aug. 3, 1978, Ser. No. 930,790
Int. Cl.² A01C 11/02
U.S. Cl. 111—4 3 Claims

1. In a planting tool for inserting a seedling container in the ground in a planting operation wherein said seedling container comprises a bottom nose section having an annular shoulder formed on the upper end thereof and a plurality of ribs extending upwardly from said nose section radially within said shoulder with a ring connected across the upper ends of said ribs and a growing plant in said container having a stem and top growth extending upwardly therefrom, wherein said tool comprises an elongated member with one end thereof comprising a tubular section having an internal diameter substantially equal to the outer diameter of said ring and an outer diameter no greater than the outer diameter of said shoulder of said nose section and a length substantially greater than the length of said ribs, the improvement of manually operable means on said tool for selectively engaging said ring to hold said container against axial removal from said tubular section when said container is mounted with said ribs and ring in said tubular section and with the end of said tubular section against said shoulder wherein the other end of said elongated member is provided with handle means for manual use of said tool, said manually operable means on said tool comprising a detent pivotally mounted on said tubular section for pivotal movement from a first position where said detent is free of any engagement with said container to a second position where said detent engages said ring of said tubular section to hold said container against axial removal from said tubular section when said container is mounted with said ribs and ring in said tubular section and with the end of said tubular section against said shoulder, spring means biasing said detent to said first position, and a flexible cable extending from said detent to said handle means and operatively associated with said handle means to draw said cable to pivot said detent to said second position against the bias of said spring means.

4,191,117
METHOD AND APPARATUS FOR ATTACHING AN ELASTIC BAND TO A TUBULAR WORKPIECE

Giancarlo Della Torre, Biassono, Italy, assignor to Rockwell-Rimoldi, S.p.A., Milan, Italy

Filed Feb. 21, 1978, Ser. No. 879,299
Claims priority, application Italy, Mar. 3, 1977, 20844 A/77
Int. Cl.[2] D05B *23/00*
U.S. Cl. 112—2 6 Claims



1. An apparatus for folding one end of a tubular workpiece over an elastic band and sewing the same therebetween in a sewing machine having a stitch forming needle and presser foot defining the sewing area thereof, said apparatus comprising:

(a) a frame (1) operatively associated with the sewing machine and movable between positions of a workpiece loading station spaced from the machine and the sewing area thereof;

(b) a tensioning device (6) mounted on said frame which includes:

(i) at least two rollers (7) for engaging the inner surface adjacent one end of the tubular workpiece;

(ii) a positioning element (15) slidably mounted on said frame (1) adjacent each of said rollers for engaging the end of the workpiece;

(iii) means defining a folding element (16) attached to said positioning element(15);

(iv) means forming a part of each roller defining a location for positioning an elastic band on the workpiece; and

(v) actuating means for simultaneously moving said positioning and folding elements from a rest position toward and parallel with the axes of said rollers to effect folding the end of the workpiece over the elastic band.

4,191,118
AUTOMATIC STITCHING PATTERN CONTROL SYSTEM AND METHOD FOR A SEWING MACHINE

Hubert Blessing, Dallas, Tex., assignor to Levi Strauss & Co., San Francisco, Calif.

Continuation-in-part of Ser. No. 809,305, Jun. 23, 1977, Pat. No. 4,109,596. This application Jun. 5, 1978, Ser. No. 912,450
Int. Cl.[2] D05B *19/00*
U.S. Cl. 112—121.11 2 Claims

1. For a sewing machine of the type including:

a working surface adapted to carry fabric being sewn,

means holding a sewing needle for reciprocation back and forth in repetitive stitching cycles through the fabric across the working surface,

means as part of the sewing machine for advancing fabric across the working surface in one direction, and

a motor source connected to reciprocate the needle,

an improved stitching pattern control system, comprising:

fabric guide means positioned adjacent said working surface and responsive to an electrical control signal for controlling the orientation of the fabric with respect to the needle as the fabric is advanced over the working surface, thereby to change the direction of stitching being placed on the fabric,

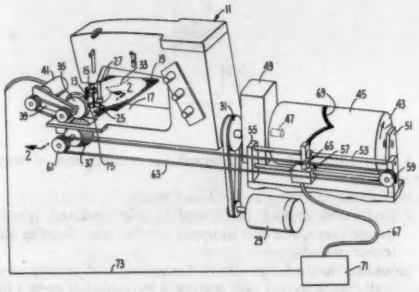
fabric sensor means provided adjacent said work surface for sensing by contact with the fabric any such change of direction,

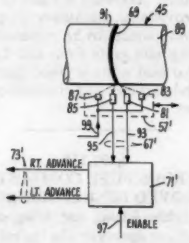
pattern means selectively driven in synchronism with said needle but independent of the fabric itself,

the pattern means including a desired, sensor readable, stitching pattern line, whose width exceeds the system accuracy, and means for moving the line pattern generally in the direction of its length past a detecting station,

pattern detector means mounted at the detecting station in a manner to be movable back and forth across the line pattern in a direction substantially orthogonal to the one direction of travel of the line pattern,

the pattern detector means including a pair of movable detectors mounted side by side so as to normally straddle the line pattern, each of the detectors producing one signal when it detects the line pattern and another signal when it does not,





means connecting the fabric sensor means to the pattern detector means for unitary movement of the pattern detector means back and forth in correspondence with movement of the fabric as detected by the fabric sensor means and

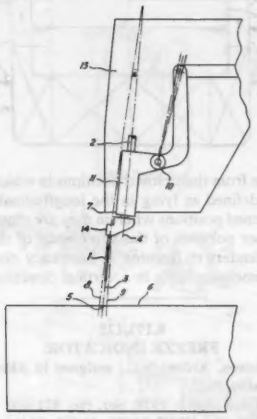
electrical means receiving the signals from the pattern detector means for generating the electrical control signal to the fabric guide means to cause it to move the fabric in a direction which, when coupled to the fabric sensor means through the fabric, maintains the pattern detector means in a position with respect to the stitching pattern so that the pattern detector means emit signals indicating that the pair of detectors are straddling the pattern line.

4,191,119

SEWING MACHINES

Tibor Arvai, Monte Carlo, Monaco, assignor to "Meci" Materiel Electrique de Controle et Industriel, Paris, France

Filed Jan. 25, 1978, Ser. No. 872,135
Claims priority, application Monaco, Feb. 2, 1977, 1228
Int. Cl.[2] D05B 3/02
U.S. Cl. 112—158 R 8 Claims



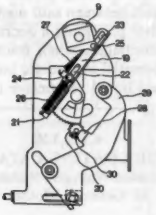
1. In a sewing machine having a housing, a working surface and a needle attached for reciprocating movement on a rigid needle bar mounted for translation movement, the relative positions of said needle and needle bar remaining unchanged during operation of the machine, the improvement comprising positioning of said needle such that its longitudinal axis diverges downwardly from the axis of translation of said needle bar, and such that said longitudinal axis of said needle crosses the working surface of said machine at a point located outside the area lying beneath said housing, whereby said point is clearly visible to the operator of said machine.

4,191,120

STITCH FORMING ELEMENT CONTROL USING STEPPING MOTORS WHICH CAN BE CALIBRATED

Bengt A. Bergvall, Jönköping, Sweden, assignor to Husqvarna AB, Sweden

Filed May 16, 1978, Ser. No. 906,572
Claims priority, application Sweden, May 17, 1977, 7705778
Int. Cl.[2] D05B 3/00, 69/12
U.S. Cl. 112—158 E 14 Claims



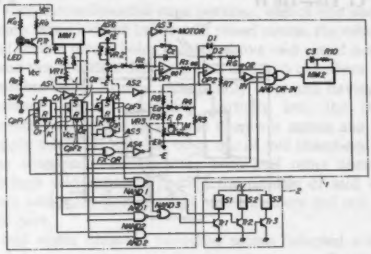
1. A sewing machine comprising control elements influenced by electric signals for the setting of a link in the driving arrangement of the fabric feeder and/or the generation of swinging movements of a needle-bar in side direction, characterized in that each control element consists of a stepping motor driving arrangement comprising a stepping motor connected to electronic pattern data circuits in the machine and a setting arrangement for the calibration of the stepping motor in a defined initial position in the form of a mechanical stop and a dog, placed on an immovable part and a movable part respectively in the stepping motor driving arrangement, and a stepping feed circuit in the pattern data circuits, the signals emitted from which step the motor towards the said stop where it is stopped.

4,191,121

BUTTONHOLE STITCH CONTROL SYSTEM FOR A SEWING MACHINE

Yasukata Eguchi, Kunitachi, and Hachiro Makabe, Fussa, both of Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed May 23, 1977, Ser. No. 799,322
Claims priority, application Japan, May 27, 1976, 51-60672
Int. Cl.[2] D05B 3/02, 3/06
U.S. Cl. 112—158 B 16 Claims



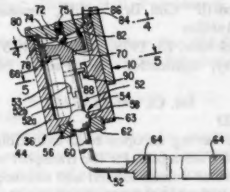
1. A buttonhole stitch control system for a sewing machine having a machine frame, a main shaft rotatably supported on the machine frame, and a stitch forming instrument including a needle bar with a needle and a feed dog and operatively connected to the main shaft, comprising a pulse generator (P.Tr, MM1) generating pulse signals in synchronism with the rotation of the main shaft; counter means (OP_1) counting the pulse signals generated by the pulse generated by the pulse generator; means (OP_2) receiving the signals counted by the counter means and dividing the process of stitching a buttonhole pattern; control means (2) receiving signals from the dividing means to control the stitch forming instrument, and means (VR_3) for sensing and electrically memorizing the size of a button employed.

4,191,122

SAFETY STOPPING DEVICE FOR A SEWING MACHINE

Howard D. Rogers, Tokyo, Japan, assignor to The Singer Company, New York, N.Y.

Filed May 16, 1979, Ser. No. 39,521
Int. Cl.[2] D05B 83/00
U.S. Cl. 112—261 10 Claims



1. A safety device for a sewing machine including an electric motor which drives the machine and control circuitry there-

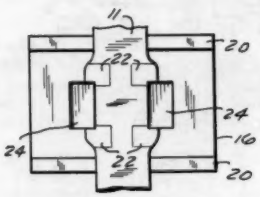
for, said device comprising a ring to extend around the sewing needle of the machine; a housing securable on the machine; an elongated member which extends from the housing and supports the ring, the member being mounted in the housing for pivotal movement by the ring in any plane which includes the longitudinal axis of the member; means biasing the elongated member into a normal position in the housing; and contact means connectible with said motor control circuitry and operable by displacement of the elongated member from its normal position for discontinuing operation of the motor.

4,191,123

METHOD OF SHAPING A SCREW TYPE CLAMPING COLLAR

André R. Luc, Ozoir-la-Ferriere, France, assignor to Tridon-Serflex S.A., Bry-sur-Marne, France

Division of Ser. No. 850,358, Nov. 10, 1977, Pat. No. 4,103,637, which is a continuation of Ser. No. 692,335, Jun. 4, 1976, abandoned. This application Jun. 6, 1978, Ser. No. 913,115
Claims priority, application France, Jun. 4, 1975, 75 18313
Int. Cl.² B21D *45/00*
U.S. Cl. 113—116 H **6 Claims**



1. The method of treating a flexible band for use in a screw-type clamping collar having a saddle housing including a pair of spaced legs thereon comprising the steps of forming the flexible band of malleable material in a predetermined width; stamping one end of said band along its edges to extend the material of the band beyond the edges thereof and form transverse shoulders on said band edges in spaced relation to each other, said stamping step comprising the step of positioning said band in a stamping press on an anvil shaped to allow lateral movement of the band material, with respect to the remainder of the band edges, at two spaced areas on each side of said one end of the band where the shoulders are to be formed; and striking the band on the anvil to force the material of the band laterally outwardly at said spaced areas to form said transverse shoulders while preventing outward flow of band material between said spaced areas without changing the thickness of the band therebetween, whereby the legs of said housing may be placed between the shoulders and bent under the band with said shoulders, integral with the band, resisting longitudinal movement of the housing along the band and the forces applied thereto when the clamp is used.

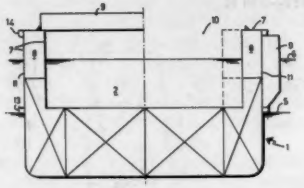
4,191,124

DOCKSHIP

Berend van der Laan, Schiedam, Netherlands, assignor to Scheepvaartbedrijf "Con Brio" N.V., Emmastad, Curacao, Netherlands Antilles

Filed Mar. 23, 1978, Ser. No. 889,574
Claims priority, application Netherlands, Mar. 25, 1977, 7703249
Int. Cl.² B63B *43/14*
U.S. Cl. 114—123 **7 Claims**

1. A dockship having an open hold extending from a forepeak bulkhead to a sterngate, for the transport of heavy cargo loads such as reactor vessels loaded and unloaded by a gantry crane running on double sideboards of the ship which form structural strength members, or lighters which can float in and out when the sterngate is opened and the ship is submerged, at least the upper portion of each of the double sideboards forming a buoyancy chamber, and said hold being provided with hatch covers, characterized by: (a) the hatch covers having a relatively thick, rectangular configuration and being watertight and buoyant, (b) two vertically spaced fenders mounted on each of the sideboard outer walls, and (c) the hatch covers



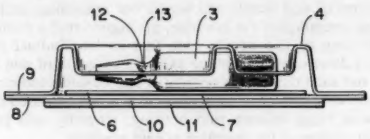
being movable from their closed positions in which their width dimension is defined as lying in the longitudinal direction of the ship to opened positions wherein they are mounted in series along the upper portions of the outer walls of the sideboards between the fenders to function as buoyancy chambers, with their width dimension lying in a vertical direction.

4,191,125

FREEZE INDICATOR

Claude D. Johnson, Arden, N.C., assignor to Akzona Incorporated, Asheville, N.C.

Filed Jul. 3, 1978, Ser. No. 921,940
Int. Cl.² G01K *11/08, 11/12, 11/14*
U.S. Cl. 116—219 **13 Claims**



1. A freeze indicator comprising:
a frangible container, said container housing a liquid which expands upon freezing, thereby fracturing said container, said liquid having a nucleating agent disbursed therein, said nucleating agent being substantially insoluble in said liquid, liquid responsive indicator means, said nucleating agent and said liquid having substantially similar molecular space groupings whereby undercooling of said liquid is substantially prevented; said container further housing a surfacant which is mixed with said liquid and said nucleating agent before freezing of said liquid for providing increased contact between said nucleating agent and said liquid and further providing a decrease in surface tension between said container, when fractured, and said liquid whereby a substantial immediate indication of freezing is provided on said liquid responsive indicating means.

4,191,126

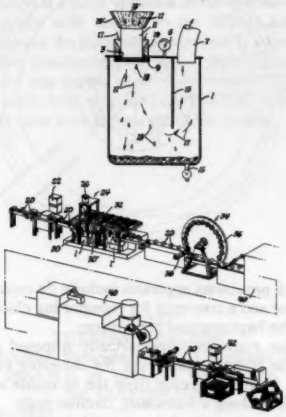
APPARATUS FOR COATING CATALYST SUPPORTS

James, R. Reed; Terrance Way, and Richard A. Leal, all of Flint, Mich., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 870,615, Jan. 19, 1978. This application Oct. 11, 1978, Ser. No. 950,382
Int. Cl.² C23C *13/08*
U.S. Cl. 118—50 **2 Claims**

1. A treating fixture for coating a ceramic monolith catalyst support which comprises a pair of tubular connecting members each member being adapted to be positioned in contact with

the upper and the lower ends of the support, the lower end of said connecting member positioned for contacting the lower end of said support being interconnected with a vacuum purge tank, the upper end of said connecting member positioned for contacting the upper end of said support being connected with a slurry feed tank, means positioned between said feed tank and connecting member positioned for contact with the upper end of the support for metering a charge of desired volume of coating slurry into said connecting member, and a plurality of



vents in the upper wall of said connecting member having interconnection with said metering means, said vents being located to be above the upper level of the coating slurry charge to enable vacuum applied through said connecting member positioned for contact with the lower end of the support to draw the coating slurry down through the passageways of the support, and means for moving at least one of said connecting members to establish contact between said connecting members and the upper and lower ends of the support.

4,191,127

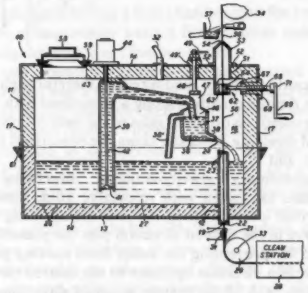
GALVANIZING APPARATUS FOR WIRE AND THE LIKE

Joseph L. Herman, Palos Park, Ill., assignor to The Joseph L. Herman Family Trust

Filed Nov. 4, 1977, Ser. No. 848,712

Int. Cl.[2] B05C *5/00, 11/04, 11/06, 11/08*

U.S. Cl. 118—57 **5 Claims**



1. Apparatus for galvanizing a wire of galvanizable iron material comprising:

(A) a generally gas tight vessel means having a wire entry port and a wire exit port, said exit port being located in a top portion of said vessel,

(B) gas charging means associated with said vessel means and adapted to supply the interior of said vessel with a substantially oxygen-free gas including gas flow regulating means,

(C) reservoir means having spigot means all located in said vessel and adapted to discharge from the spigot mouth thereof a stream of molten zinc moving in a generally transverse horizontal direction.

(D) supply means associated with said reservoir means and adapted to deliver thereto molten zinc,

(E) wire transport means adapted to position a length of said wire vertically and to move said wire vertically upwardly via said ports through said vessel means in spaced adjacent relationship to said spigot mouth and in a stream of molten zinc issuing therefrom, thereby coating said wire with said molten zinc, said wire transport means including two sheave means, which are in an aligned vertical spaced relationship relative to one another as respects a respective circumferential edge portion of each and which are adapted to move said wire vertically from one to the other of such circumferential edge portions, one of said sheave means being located below said vessel means, the other of said sheave means being located above said vessel means,

(F) said vessel means being divided into two chambers, one chamber being located substantially over and having an entrance portion extending partially into the other thereof, said spigot means said reservoir means and said supply means being in the other one of said chambers, said one chamber communicating with said other chamber through said entrance portion for passage of said wire from said entry port through said chambers and out said exit port.

(G) said upper chamber including means (adapted to) for maintaining said upper chamber at a generally cooler interval operating temperature than said lower chamber, and

(H) wire wipe means, including mounting means therefor, located in said upper chamber adjacent said lower chamber, and in fixed relationship to said vertically movable wire along the path of wire travel thereof, said wire wipe means having smoothing means for the molten zinc coating on said wire moving therethrough, said smoothing means comprising solid members defining an orifice having a generally vertically oriented axis and having a cross sectional configuration which is generally proportional to the cross sectional configuration of said wire, thereby adapting said orifice to conform exterior surface portions of such zinc coating on said wire to such cross-sectional configuration of said orifice,

(I) said vessel means, said supply means, said wire transport means, and said wire wipe means cooperating with one another to permit said wire so vertically positioned and so upwardly moving to be free from contact with any solid object except for said smoothing means until after said zinc coating on said wire has solidified.

4,191,128

VACUUM METALLIZING OF HOLLOW ARTICLES

Claude J. L. Hunt, Hinton Hall, Peterchurch, Herefordshire, England

Filed Nov. 7, 1978, Ser. No. 958,434

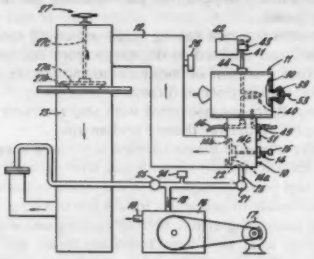
Claims priority, application United Kingdom, Nov. 19, 1977, 48253/77

Int. Cl.[2] C23C *13/02, 13/12*

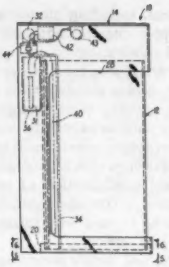
U.S. Cl. 118—720 **10 Claims**

1. Vacuum metallising apparatus for coating the inside of hollow articles wherein a carrier for a plurality of said hollow articles has a plurality of seatings each for receiving one said hollow articles, said carrier being hollow and connected to a high vacuum source through suitable valve means, a filament assembly mounted inside said carrier for movement relative to

said carrier whereby a filament of said filament assembly and carrying the metal for coating said hollow articles can be moved past and adjacent to each of said seatings during evaporation of said coating metal under high vacuum when a plurality of said hollow articles are each engaged with a respective one of said seatings and the interior of each said hollow article is at high vacuum.

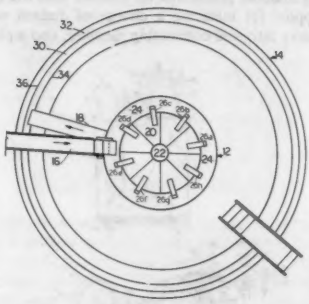


4,191,129
ART OF EXHIBITING FISH
Arthur B. Renny, 11688 Wayburn, Detroit, Mich. 48224
Filed Feb. 17, 1978, Ser. No. 878,706
Int. Cl.[2] A01K *64/00*
U.S. Cl. 119—5 **6 Claims**



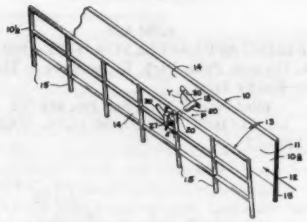
1. Improvement in the art of exhibiting fish comprising a vertical aquarium consisting of a transparent fish tank and a metal cowl, said aquarium requiring the usual accoutrements for proper operation thereof, said fish tank standing vertically and having a height greater than its width or depth, said cowl standing vertically and having a height, width, and depth greater than that of said fish tank, said cowl covering said accoutrements and silencing in part the noise from the operation thereof, said cowl having a cutaway portion in the front and side walls thereof so as to expose said fish tank to view, and said fish tank having radiused front corners and no seams therealong so as to present from the front and sides thereof a full and unobstructed view thereof, said cowl having vertically extending sheet metal stanchions at the rear corners of said fish tank, said cutaway portion extending continuously around the sides and front of said cowl from one rear corner stanchion thereof to the other, whereby said cowl is wholly devoid of any front corner stanchions resulting in the aforesaid full and unobstructed view of said fish tank.

4,191,130
CHICK PROCESSING APPARATUS
Harry J. Musgrave, P.O. Box 214, Nashville, Ark. 71852
Filed Aug. 14, 1978, Ser. No. 933,150
Int. Cl.[2] A01K *45/00*
U.S. Cl. 119—22 **12 Claims**



1. In chick processing apparatus including a rotatable turntable conveyor and a conveyor for transporting chicks from the turntable, the improvement comprising:
an annular conveyor concentrically disposed around the rotatable turntable conveyor for receiving chicks transported by the conveyor from the turntable and moving the chicks along a horizontal, circular path;
said annular conveyor being provided with a plurality of adjacent trough-like tray rings.

4,191,131
CATTLE CHUTE WITH DIRECTIONAL RESTRICTING MEANS
Don M. Farlow, 1305 Chicago Ave., Nampa, Id. 83651
Filed Mar. 20, 1978, Ser. No. 888,379
Int. Cl.[2] A01K *29/00*
U.S. Cl. 119—155 **2 Claims**



1. A cattle chute for guiding cattle therethrough in single file and in a desired direction along a prescribed path, comprising:
guide means on opposite sides of the path for receiving cattle and directing the cattle along the prescribed path in single file; and
complementary gravity-actuated directional restricting means associated with respective guide means at a prescribed location along the path for allowing the cattle to move in the desired direction past the prescribed location and for preventing the cattle from moving past the location in a direction opposite to the desired direction;
wherein each of the gravity actuated directional restricting means comprises:
a paddle;
pivot means mounting the paddle to the guide means for pivotal movement about a fixed axis between an operative position wherein the paddle projects into the prescribed

path and an inoperative position wherein the paddle is pivoted in the desired direction clear of the prescribed path; and

stop means associated with the paddle for preventing pivotal movement of the paddle in a direction opposite to the desired direction beyond its operative position;

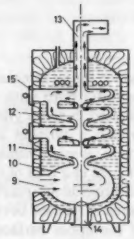
wherein the fixed axis is tilted inward toward the path and rearward to the desired direction to define an off-horizontal swingpath for the paddle; said swingpath having a low point located at a point upstream of the operative position of the paddle with respect to the desired direction of travel to cause the paddle to automatically swing from its inoperative position to the operative position and firmly against the stop means under the influence of gravity to prevent cattle from moving in the opposite direction once the cattle have moved forward of the paddle.

4,191,132

THERMIC REACTOR

Veikko E. Rahikka, Kaksostentie 5A 73, Helsinki, Finland

Filed Nov. 29, 1977, Ser. No. 855,543
Int. Cl.² F22B *13/02*
U.S. Cl. 122—156 **5 Claims**



1. A thermic reactor utilizing turbulent flow to ensure good heat transfer between hot exhaust gases from a combustion chamber, and the walls of the thermic reactor, comprising a plurality of V-shaped chambers in serial communication with each other;

a first said chamber having a first chamber inlet for receiving hot gases; a tangentially located first chamber outlet, and a centrally located first chamber outlet;

a second said chamber having a centrally located second chamber inlet and a tangentially located second chamber inlet, said second chamber central inlet being in communication with said centrally located first chamber outlet and being disposed at an opposite end of said said second chamber, from said second chamber outlet; and a tangential conduit communicating said first chamber tangential outlet with said second chamber tangential inlet,

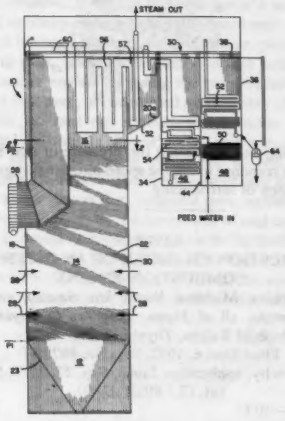
to form two gas flow paths through said chambers, one path expanding and contracting in size as the gas passes from said first chamber to said second chamber through said central inlet and outlet, and a second path generally spiraling through said tangential conduit, said paths including combined intersecting and countercurrent flow patterns with respect to each other thereby to produce enhanced turbulent flow patterns in gas flow through said thermic reactor.

4,191,133

VAPOR GENERATING SYSTEM UTILIZING INTEGRAL SEPARATORS AND ANGULARLY ARRANGED FURNACE BOUNDARY WALL FLUID FLOW TUBES HAVING RIFLED BORES

William D. Stevens, North Caldwell, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Nov. 7, 1977, Ser. No. 849,273
Int. Cl.² F22B *21/34*
U.S. Cl. 122—235 R **13 Claims**



1. A vapor generating system comprising an upright furnace section the boundary walls of which are formed by a plurality of tubes having fins extending outwardly from diametrically opposed portions thereof, with the fins of adjacent tubes being welded together to form a gas-tight structure, burner means associated with said furnace section, said tubes being directly exposed to heat from said burner means for the entire height of said boundary walls, said tubes extending vertically in the plane of each boundary wall in the lower portions and upper portions of said furnace section walls and extending at an acute angle with respect to a horizontal plane in the intermediate portions of said boundary walls extending between said upper and lower portions, at least a portion of each of said tubes having a rifled bore, and means for simultaneously passing said fluid through the tubes of all of said boundary walls to apply said heat to said fluid.

4,191,134

FLUID INJECTION SYSTEM AND METHOD FOR AN INTERNAL COMBUSTION ENGINE

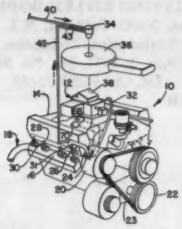
Toronta P. Goodman, Summit Point, W. Va., assignor to The Goodman Systems, Inc., Armonk, N.Y.

Filed Aug. 10, 1979, Ser. No. 64,373
Int. Cl.² F02M *25/02*
U.S. Cl. 123—25 J **25 Claims**

1. A system for injecting fluid into a cylinder of an internal combustion engine having an output shaft and an exhaust system, said system comprising first means for receiving air and pressurizing said air, second means for introducing pressurized air from said first means to a source of said fluid for injecting said fluid into said cylinder, and third means in a responsive relation to said output shaft and said exhaust system for regulating the pressure of said latter pressurized air in response to engine speed and exhaust gas pressure before said pressurized air is introduced to said source of fluid.

19. A method for improving the efficiency of an internal combustion engine having a combustion chamber, an output shaft, an exhaust system and a air pressurizer driven by said output shaft for pressurizing air for passage to said exhaust

system; said method comprising the steps of introducing pressurized air from said pressurizer to a source of fluid, injecting said fluid into said combustion chamber in response to said step



of introducing, and regulating the pressure of said latter pressurized air in response to engine speed and exhaust gas pressure before said step of introducing.

4,191,135

COMBUSTION CHAMBER OF AN INTERNAL COMBUSTION ENGINE

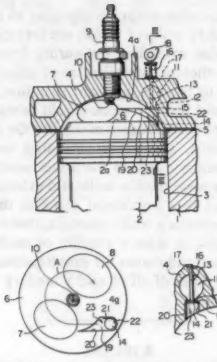
Hidetaka Nohira, Mishima; Sumio Ito, Susono, and Hisashi Ohki, Numazu, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 6, 1977, Ser. No. 857,887

Claims priority, application Japan, Sep. 27, 1977, 52-115104

Int. Cl.[2] F02B *23/00*

U.S. Cl. 123—30 C **31 Claims**



1. In a lean-mixture internal combustion engine having a cylinder block with a cylinder bore therein; a cylinder head mounted on said cylinder block, a piston reciprocally movable in said cylinder bore, a combustion chamber formed between said cylinder head and said piston, an intake valve movably mounted in said cylinder head for admitting a suction gas into said combustion chamber, an exhaust valve movably mounted in said cylinder head for discharging an exhaust gas from the combustion chamber into the atmosphere, and means for creating turbulent mixing during the combustion period in said combustion chamber, the improvement wherein said means for creating turbulence comprises:

a cavity in said cylinder head having a port connected to said combustion chamber;

valve means located in said port of the cavity;

means for actuating said valve means to shut said port near the end of each compression stroke of said piston to permit storage of the uncombusted suction gas accumulated in said cavity from said combustion chamber during the latter part of the compression stroke, at a pressure substantially equal to that in the combustion chamber just before said port is closed, and to reopen said port near the start of each compression stroke, to spout out a jet of said accmulated uncombusted gas under said pressure into said combustion chamber from said cavity during the first part of the compression stroke; and

guide means formed in said cylinder head to provide a channel leading from said port of the cavity into the combustion chamber for guiding said jet of the accumulated suction gas to enter the combustion chamber in a direction having a substantial component tangent to a surface thereof to create a swirl motion in said combustion chamber strong enough to be sustained during the combustion period.

4,191,136

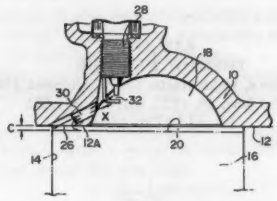
COMBUSTION CHAMBER OF AN INTERNAL COMBUSTION ENGINE

Hiromitsu Matsumoto, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Mar. 6, 1978, Ser. No. 883,827

Int. Cl.[2] F02B *19/16*

U.S. Cl. 123—30 C **2 Claims**



1. A combustion chamber for an internal combustion engine cylinder which has a cylinder bore with an axis and a piston axially reciprocably mounted in said cylinder bore, said combustion chamber comprising: a cylinder head with a combustion recess, a mating surface on said cylinder head overhanging into the cylinder bore at least at a part of the circumference of the combustion recess to provide an overhanging surface portion whereby a squash area is formed between said overhanging surface portion and the upper surface of the piston, said combustion recess being dome-like and facing into said cylinder bore, and a spark plug disposed in the cylinder head at a position radially offset from said axis with a spark generating section disposed in said cylinder recess, said cylinder head having an aperture with one of its ends opening into the squash area on the overhanging surface portion and its other end opening into the combustion recess of the cylinder head and directed substantially at said spark generating section of the spark plug.

4,191,137

ELECTRONIC FUEL INJECTION CONTROL FOR AN INTERNAL COMBUSTION ENGINE

Malcolm Williams, Solihull; Albert R. Tingey, Whitacre Heath; John P. Southgate, Coventry, and Steven J. Russell, Braunton, Nr. Barnstable, all of England, assignors to Lucas Industries Limited, Birmingham, England

Continuation of Ser. No. 847,511, Nov. 1, 1977, abandoned. This application Feb. 7, 1979, Ser. No. 10,189

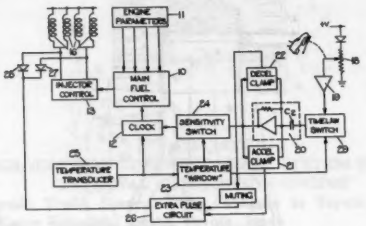
Claims priority, application United Kingdom, Nov. 4, 1976, 45859/76

Int. Cl.[2] F02B *3/00*

U.S. Cl. 123—32 EH **8 Claims**

1. An electronic fuel injection control comprising a main control circuit sensitive to the value of at least one engine operating parameter and arranged to control the rate at which fuel is injected as a function of said parameter, means for gener-

ating an electrical demand signal, and an electronic differentiating circuit sensitive to the rate of change of said demand signal and arranged to increase or decrease the rate of fuel delivery to the engine according to the sign and magnitude of the rate of change of said demand signal, said differentiating circuit comprising an operational amplifier connected to operate in inverting mode and having an input capacitor and a feedback resistor, and clamping circuits for limiting the excursion of the output of the operational amplifier in both senses, each clamping circuit including a first transistor, a bias circuit imposing a bias voltage on the base of said first transistor, the



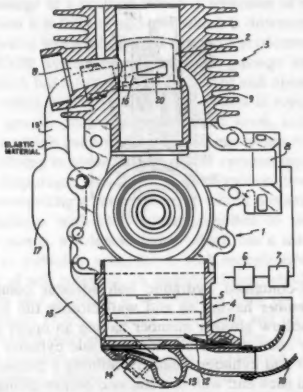
collector of said first transistor being connected to divert some of the current flowing through the input capacitor so that such current does not flow through the feedback resistor, and a second transistor having its collector-emitter path connected between the emitter of said first transistor and a supply conductor and its base connected to an output terminal of said operational amplifier, whereby said first and second transistors turn on when the operational amplifier output terminal reaches a set voltage determined by said bias circuit so as to divert sufficient capacitor current to maintain the operational amplifier output terminal at said set voltage.

4,191,138

TWO-CYCLE INTERNAL COMBUSTION ENGINE

Eric Jaulmes, Paris, France, assignor to Ateliers de la Motobecane, S.A., Pantin, France

Filed Jul. 31, 1978, Ser. No. 929,231
Claims priority, application France, Aug. 22, 1977, 77 25558
Int. Cl.² F02B *33/04, 1/08*
U.S. Cl. 123—73 R **10 Claims**



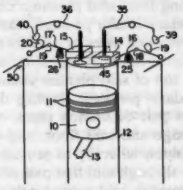
1. A two-cycle internal combustion engine wherein uncarbureted air is used to purge gases produced by combustion from a combustion chamber prior to feeding carbureted air into same, the engine comprising a first cylinder having an engine piston which moves therein and a second cylinder mounted 180° to the first cylinder in the engine, having a movable balancing device, which moves therein, the inner faces of said engine piston and movable balancing device delimiting the chamber of a crankcase pump, the outer face of said engine piston delimiting said combustion chamber having an inlet and the outer face of said movable balancing device delimiting an auxiliary compression chamber having an outlet, further comprising at least one transfer channel connecting said crankcase pump chamber to said combustion chamber for admitting carbureted air from said crankcase pump chamber to said combustion chamber; a first pure, uncarbureted air tube connecting said auxiliary compression chamber to said combustion chamber and having a buffer reservoir therein; pure air means for admitting pure, uncarbureted air into said auxiliary compression chamber and for pumping the pure, uncarbureted air through said first pure, uncarbureted air tube into said combustion chamber, at least one carbureted air intake port being connected to said transfer channel and at least one pure, uncarbureted air intake port being connected to said first pure, uncarbureted air tube disposed in the wall of said first cylinder in such a manner that said at least one pure, uncarbureted air intake port is uncovered by the movement of said engine piston from the top of said first cylinder towards the bottom thereof and pure, uncarbureted air flows into said combustion chamber to purge gases therefrom before said at least one carbureted air intake port is uncovered by the same movement of said engine piston piston to admit carbureted air into said combustion chamber which mixes with the pure, uncarbureted air which continues to flow into said combustion chamber via said at least one pure, uncarbureted air intake port.

4,191,139

ENGINE WITH SECONDARY PISTONS

Vincent J. Tompkins, Allview Ave., R.D. 5, Brewster, N.Y. 10509

Filed Jun. 5, 1978, Ser. No. 912,179
Int. Cl.² F02B *75/04*
U.S. Cl. 123—48 A **2 Claims**



1. In an engine having at least one conventional main engine cylinder with a piston mounted for travel within the chamber formed by the cylinder walls, the combination comprising:

a pair of opposed secondary pistons mounted side by side on the upper surface of the cylinder chamber, said pistons each including a chamber mounted over and coupled to the cylinder chamber and a plunger reciprocable therein and,

a piston rod coupled to each secondary piston at one end and fixedly mounted at the other end, said piston rod comprising two portions pivotable about an intermediate point, eccentric means engaging and driving said pistons in a reciprocal motion and spring means mounted opposite said eccentric means for returning said secondary pistons to their initial position,

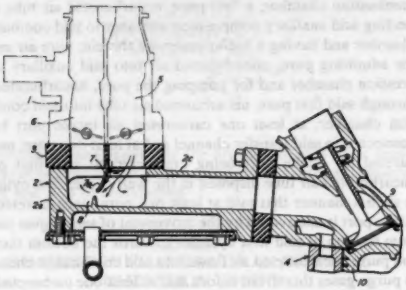
separate means for operating said secondary pistons in conjunction with the main piston such that the plungers enter the respective chambers at a predetermined time interval to produce combustion of the fuel in the main engine cylinder by compression thereby eliminating the need for ignition of the fuel in the said cylinder.

4,191,140

INDUCTION FLOW GUIDE DEVICE FOR INTERNAL COMBUSTION ENGINE INTAKE MANIFOLD

Hiromitsu Matsumoto, and Toshio Kurahashi, both of Hamamatsu, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Mar. 6, 1978, Ser. No. 883,825
Int. Cl.[2] F02B 75/18
U.S. Cl. 123—52 MB **2 Claims**



1. In an engine induction system wherein a plurality of engine cylinders are supplied with air/fuel mixture by a compound carburetor having a separate primary and secondary intake passage through an intake manifold which has a plenum chamber that receives mixture from said two intake passages and distributes said mixture to the cylinders through respective branch pipes, said primary passage being closer to the cylinders than the secondary passage, and said plenum chamber having a floor opposite where the primary and secondary passages enter said plenum chamber, a first pair of said branch pipes departing from said plenum chamber closer to said primary intake passage than to said secondary intake passage an on the same side of said intake passage, a second pair of said branch pipes departing from said pleunum chamber relatively closer to said secondary intake passage than to said primary intake passage, on opposite sides of said intake passage from one another, the improvement comprising: a rectifying plate depending from the top of said plenum chamber between the primary and secondary passage, sloping downwardly and away from said first pair of branch pipes, with a clearance between its lower edge and said floor, and confronting said first pair of branch pipes, whereby to provide a coanda effect effect to reduce flow through said first pair of branch pipes and to encourage flow through said second pair of branch pipes.

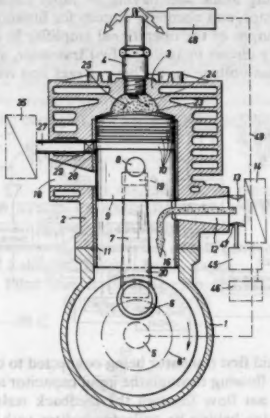
4,191,141

TWO-STROKE ENGINE WITH AUXILIARY FLUID MEANS

Walter Franke, Hittfelder Kirchweg 22, 2105 Seevetal 3, Fed. Rep. of Germany

Filed Mar. 16, 1978, Ser. No. 887,254
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1977, 2711641
Int. Cl.[2] F02B 75/02, 41/02, 33/04
U.S. Cl. 123—65 A **10 Claims**

1. A two-stroke internal combustion engine comprising: cylinder means including inner wall means defining interior portions of said cylinder means; piston means operably reciprocal within said cylinder means between an upper and a lower dead center position; inlet port means for introducing a supercharged fuel-air mixture into said cylinder means; ignition means for igniting said fuel-air mixture within said cylinder means; exhaust port means in flow communication with the interior of said cylinder means at a location immediately above said piston means with said piston means in said bottom dead center position for exhausting combustion gases from within said cylinder means; and auxiliary port means including auxiliary fluid source means for introducing an auxiliary fluid into said cylinder means; said auxiliary port means extending through said inner wall means in flow communication with said cylinder means interior portions at a location directly



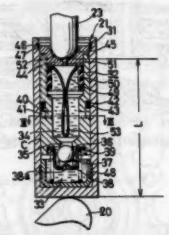
above and generally angularly aligned with said exhaust port means, said inlet port means being located to extend through said inner wall means in flow communication with said cylinder means interior portion at a location angularly displaced by about 90° from said exhaust port means and said auxiliary port means.

4,191,142

SELF-CONTAINED HYDRAULIC LASH ADJUSTER

Hisashi Kodama, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 23, 1978, Ser. No. 880,519
Claims priority, application Japan, Mar. 2, 1977, 52/22926
Int. Cl.[2] F01L 1/24
U.S. Cl. 123—90.58 **3 Claims**



1. A self-contained hydraulic lash adjuster comprising a cylinder member having an end wall closing the lower end thereof, a hollow plunger member having an upper open end and a lower end wall slidable axially in said cylinder member, said plunger and cylinder members defining a pressure chamber between each end wall thereof, said hollow plunger member having a reservoir chamber therein, a push rod seat member engaging said upper end of said plunger member for closing said reservoir chamber and for transmitting the thrust of said plunger member to a push rod, said push rod seat member being provided with a central hole, means for allowing a relatively slow rate of fluid flow from said pressure chamber to said reservoir chamber, a check valve for allowing a relatively

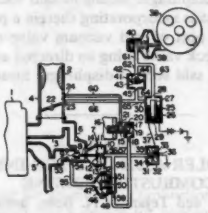
rapid rate of fluid flow only from said reservoir chamber to said pressure chamber through a passage provided in the end wall of said plunger member, an elastomeric bag member having a generally tubular shape with a closed bottom end and an open upper end, said open upper end being fixed to the inner wall of said plunger member and said closed bottom end being freely disposed in said reservoir chamber, the interior of said bag member being normally disposed in communication with atmospheric pressure through said central hole in said push rod seat member and the outer surface of said bag member being in fluid tight contact with said reservoir chamber.

4,191,143

EGR/IGNITION TIMING CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Kiyoshi Yuuki, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Sep. 8, 1978, Ser. No. 940,648
Claims priority, application Japan, Mar. 8, 1978, 53-26147
Int. Cl.[2] F02P 5/04; F02M 25/06
U.S. Cl. 123—117 A **8 Claims**



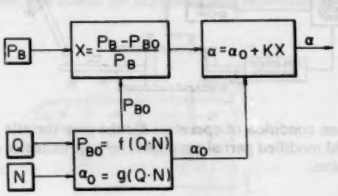
1. In an internal combustion engine having an intake system which has an intake passage, a throttle valve incorporated in said intake passage, and a vacuum port which opens to said intake passage at a position which is upstream of said throttle valve when it is fully closed and which is downstream of said throttle valve when it is opened beyond a predetermined opening, an EGR system having an EGR passage and an EGR valve which has a first diaphragm means and opens said EGR passage when said first diaphragm means is supplied with a vacuum greater than a predetermined level, and a vacuum advancer which has a second diaphragm means and advances ignition timing in accordance with the vacuum supplied to said second diaphragm means, an EGR/ignition timing control system comprising a vacuum switch which is opened or closed in accordance with the vacuum supplied to said first diaphragm means, a solenoid valve which has a solenoid and is opened or closed in accordance with energization or deenergization of said solenoid, an electric circuit which selectively energizes said solenoid in accordance with the operation of said vacuum switch, a check valve, first and second passage means which individually connect said first and second diaphragm means to said vacuum port, said second passage means incorporating therein a parallel connection of said solenoid valve and said check valve, said solenoid valve being adapted to be closed when the vacuum supplied to said first diaphragm means is above a predetermined level and to be opened when the vacuum supplied to said first diaphragm means is below a predetermined level, and said check valve being so directed as to allow fluid to flow only from said second diaphragm means toward said vacuum port.

4,191,144

METHOD FOR CONTROLLING IGNITION TIMING IN AN INTERNAL COMBUSTION ENGINE

Hidetaka Nohira, Mishima; Kiyoshi Kobashi, Susono, and Jiro Nakano, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 4, 1978, Ser. No. 893,391
Claims priority, application Japan, Sep. 5, 1977, 52-105900
Int. Cl.[2] F02P 5/04; F02B 5/02
U.S. Cl. 123—117 R **6 Claims**



1. A method for controlling ignition timing in an internal combustion engine having an exhaust gas recirculation device, an intake manifold, and an ignition system, said method comprising the steps of

measuring the amount Q of air taken into said engine, the rotational speed N of said engine and the value P_B of absolute pressure in said intake manifold of said engine when exhaust gas is being recirculated;

calculating the value P_{BO} of absolute pressure in said intake manifold when exhaust gas is not being recirculated, said calculation being performed by using said measured amount Q of air taken into said engine and by using said measured rotational speed N of said engine;

calculating an optimum spark-advance angle α_O in said engine when exhaust gas is not being recirculated, said calculation being performed by using said measured amount Q of air taken into said engine and by using said measured rotational speed N of the said engine;

calculating an exhaust gas recirculation ratio X using said measured value P_B for absolute pressure in said intake manifold and said calculated value P_{BO} for absolute pressure in said intake manifold;

calculating an optimum spark-advance angle α in said engine when exhaust gas is being recirculated, said calculation being performed by using said calculated optimum spark-advance angle α_O in said engine and by using said calculated exhaust gas recirculation ratio X; then

controlling ignition timing of said ignition system in response to said calculated optimum spark-advance angle α.

4,191,145

VACUUM SENSOR

Albert L. Fowler, Kirkaldy, Scotland, assignor to Hughes Microelectronics Limited, Glenrothes, Scotland

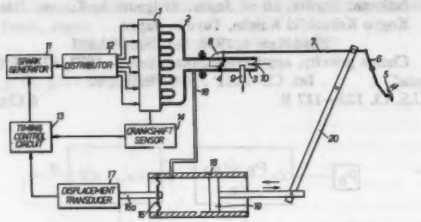
Filed May 19, 1978, Ser. No. 907,440
Claims priority, application United Kingdom, Oct. 18, 1977, 43380/77
Int. Cl.[2] F02P 5/04
U.S. Cl. 123—117 A **8 Claims**

1. A vacuum sensor for use with an internal combustion engine having an inlet manifold for receiving gas to be consumed by said engine, and a throttle adapted to be selectively positioned so as to control the volumetric flow rate of said gas into said inlet manifold, said vacuum sensor comprising:

a vacuum transducer for sensing the level of partial vacuum applied thereto; and

means for applying the level of partial vacuum present in said inlet manifold to said vacuum transducer after the operation of said engine reaches dynamic equilibrium and for modifying, during a change in throttle position, the

level of partial vacuum applied to said transducer so that before the partial vacuum level present in said inlet manifold changes to a new value associated with the equilibrium condition of operation for the new throttle position, said modified partial vacuum level approximates said new value.

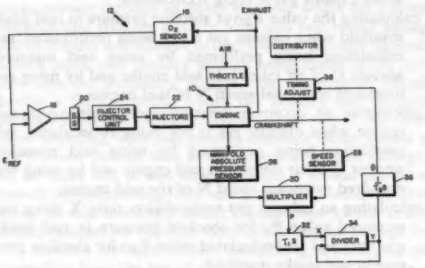


4,191,146

MEANS FOR OPTIMIZING FUEL ECONOMY IN AN INTERNAL COMBUSTION ENGINE

Lael B. Taplin, Bloomfield, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Feb. 28, 1978, Ser. No. 882,002
Int. Cl.[2] F02P *5/04*
U.S. Cl. 123—117 R **6 Claims**



1. In an internal combustion engine of the spark ignition type, a system for optimizing spark timing comprising:

means for generating a speed signal proportional to the speed of the engine;

means for generating a pressure signal proportional to the engine manifold absolute pressure;

means for multiplying together said speed and said pressure signals for generating a product signal; and

adaptive controller means responsive to said product signal from said multiplying means for setting the ignition spark timing of the engine to maximize the amplitude of said product electrical signal.

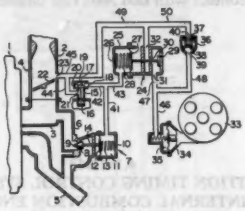
4,191,147

EGR/IGNITION TIMING CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Kiyoshi Yuuki, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Sep. 8, 1978, Ser. No. 940,649
Claims priority, application Japan, Mar. 8, 1978, 53-26148
Int. Cl.[2] F02P *5/04*; F02M *25/06*
U.S. Cl. 123—117 A **3 Claims**

1. In an internal combustion engine having an intake system which has an intake passage, a throttle valve incorporated in said intake passage, and a vacuum port which opens to said intake passage at a position which is upstream of said throttle valve when it is fully closed and which is downstream of said throttle valve when it is opened beyond a predetermined opening, an EGR system having an EGR passage and an EGR valve which has a first diaphragm means and opens said EGR passage when said first diaphragm means is supplied with a vacuum greater than a predetermined level, and a vacuum advancer which has a second diaphragm means and advances ignition timing in accordance with the vacuum supplied to said second diaphragm means, an EGR/ignition timing control system comprising a vacuum valve which has a third diaphragm means, a valve element operated by said diaphragm means and a valve port which is closed by said valve element when said third diaphragm means is supplied with a vacuum greater than a predetermined level, a check valve, first, second and third passage means which individually connect said first, second and third diaphragm means to said vacuum port, said second passage means incorporating therein a parallel connection of said valve port of said vacuum valve and said check valve, and said check valve being so directed as to allow fluid to flow only from said second diaphragm means toward said vacuum port.

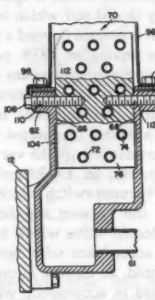


4,191,148

AFTERCOOLER ASSEMBLY FOR INTERNAL COMBUSTION ENGINE

Harshad H. Patel, and Tejandra N. Bose, both of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Jun. 30, 1977, Ser. No. 811,912
Int. Cl.[2] F28F *1/32*; F02B *33/44*
U.S. Cl. 123—119 CD **9 Claims**



1. An aftercooler assembly for an internal combustion engine, said assembly comprising,

housing means defining an elongated chamber having at least one inlet and outlet for air, said housing means having a pair of elongated opposed interconnected side and end walls forming an elongated trough having a substantially continuous planar surface; defined by the extremities of said side and end walls;

an elongated aftercooler core positioned in said chamber, said core comprising a plurality of coolant conduits ex-

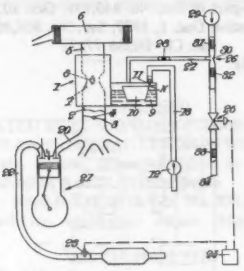
tending generally parallel to the longitudinal axis of said housing means and having a pair of core support plates at opposite ends of said aftercooler core and at least one core support plate intermediate said end core support plates, all of said support plates extending generally transverse to and structurally connected to said coolant conduits; and means for securing said intermediate core support plate to both of said side walls adjacent said planar surface, thereby forming a structural support for said aftercooler core and reinforcing the side walls of said housing.

4,191,149

CARBURETORS FOR INTERNAL COMBUSTION ENGINES

Rathindra Dutta, Kaarst; Josef Rosgen, Grevenbroich, and Gerd Rosemann, Munchen-Gladbach, all of Fed. Rep. of Germany, assignors to Societe Industrielle de Brevets et d'Etudes S.I.B.E., Neuilly sur Seine, France

Filed Dec. 16, 1977, Ser. No. 861,358
Claims priority, application France, Jan. 14, 1977, 77 01078
Int. Cl.[2] F02M *7/00, 7/06*
U.S. Cl. 123—119 EC **7 Claims**



1. A carburetor for an internal combustion engine, comprising a float chamber and a device for controlling the gas pressure in the float chamber, said device having: an air source at a pressure below atmospheric pressure; airflow passage means connecting said source and atmosphere; throttle means on said air-flow passage means for impressing a head loss to the airflow; an oxygen sensitive probe adapted to be immersed in the exhaust gas of the engine and to provide an electrical signal representative of the oxygen content of said exhaust gases; control means for actuating said throttle means responsive to said electrical signal; and means connected to the float chamber, located in the airflow passage means and so constructed that it conveys to the float chamber a pressure whose value is outside the range between the pressure of the source and atmospheric pressure for a predetermined range of values of said head loss, said last-named means comprising a pitot tube, one end of which opens directly into the float chamber and the other end of which extends within and opens directly into the airflow passage means intermediate the ends thereof.

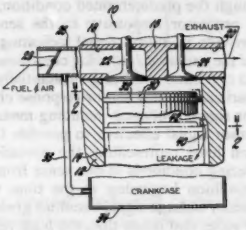
4,191,150

ENGINE WITH SELECTIVE VENTING OF UNBURNED MIXTURE FROM THE PISTON CREVICE VOLUME

Robert M. Siewert, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 20, 1978, Ser. No. 890,598
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 B **4 Claims**

1. An internal combustion engine having a cylinder with closed and open ends, a piston reciprocably disposed in the cylinder with one end opposing the cylinder closed end to define a combustion space therebetween with an annular crevice volume around said piston one end formed by clearance between the piston and cylinder, the piston being reciprocable between extreme top and bottom dead center positions, respectively, nearest to and farthest from the cylinder closed end, seal means on the piston spaced from said one end and engaging the cylinder to seal the combustion space and crevice volume from the cylinder open end and thus limit blowby leakage from the combustion space to the cylinder open end, intake means for admitting air to the combustion space for compression during a first piston stroke toward top dead center and the subsequent combustion of fuel therein, exhaust means for permitting discharge of combustion products from the combustion space following expansion on a second piston stroke toward bottom dead center, and means for collecting and recirculating to the



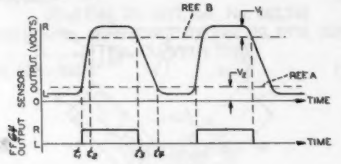
intake means blowby gases escaping from the combustion space to the open end of the cylinder, and the improvement comprising bypass means operative to open a limited passage for gas flow from the crevice volume to the cylinder open end during each piston expansion stroke, substantially after the beginning thereof but in advance of the opening of said exhaust means on each said expansion stroke, whereby unburned fuel-air mixture is removed from the crevice volume before the exhaust step and recirculated to the intake means for readmission and burning in the cylinder, thus reducing the exhaust of unburned products from the engine.

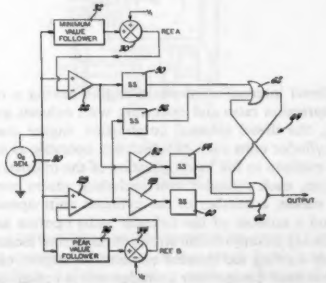
4,191,151

OXYGEN SENSOR SIGNAL PROCESSING CIRCUIT FOR A CLOSED LOOP AIR/FUEL MIXTURE CONTROLLER

Joseph L. Wanamaker, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 20, 1978, Ser. No. 888,247
Int. Cl.[2] F02B *3/00*
U.S. Cl. 123—119 EC **3 Claims**





1. A fuel control system for an internal combustion engine

having combustion space into which an air/fuel mixture is supplied to undergo combustion and having means defining an exhaust passage from the combustion space into which spent combustion gases are discharged and are directed to the atmosphere, comprising, in combination:

a sensor responsive to the oxidizing/reducing conditions in the exhaust passage effective to produce a sensor signal varying between high and low values when the oxidizing/reducing conditions vary through a predetermined oxidizing/reducing condition, the sensor being characterized in that its response to changing oxidizing/reducing conditions in a first direction through the predetermined condition varies from its response to changing oxidizing/reducing conditions in an opposite direction through the predetermined condition;

a sensor signal processor responsive to the sensor signal effective to provide an output signal indicating the sense of deviation of the oxidizing/reducing conditions from the predetermined condition and being substantially independent of said variances in said sensor response characteristics, the sensor signal processor including means responsive to the sensor signal effective to provide the output signal at a first level representing the deviation of the oxidizing/reducing conditions in one sense from the predetermined condition beginning at the time when the value of the sensor voltage signal becomes greater than a first reference value that is less than the high value of the sensor signal and at a second level representing the deviation of the oxidizing/reducing conditions in an opposite sense from the predetermined condition beginning at the time when the value of the sensor signal becomes less than a second reference value that is greater than the low value of the sensor signal; and

means responsive to the output signal effective to adjust the air/fuel mixture in a sense tending to restore the predetermined oxidizing/reducing conditions.

4,191,152

MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

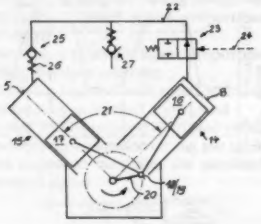
Herbert Deutschmann, Friedrichshafen, Fed. Rep. of Germany, assignor to Motoren- und Turbinen-Union Friedrichshafen GmbH, Fed. Rep. of Germany

Filed Oct. 7, 1977, Ser. No. 840,179

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1976, 2648411

Int. Cl.[2] F02B *11/02*

U.S. Cl. 123—119 C **15 Claims**



1. A diesel internal combustion engine having a relatively low compression ratio and operating with exhaust gas turbocharging, the diesel internal combustion engine comprising several cylinder units each of which are operable as an engine during a medium to full load operation of the internal combustion engine, each cylinder unit including piston means and cylinder means, a number of the cylinder units operate as an engine and a number of the cylinder units operate as a compressor during a compression stroke of the piston means for the purpose of starting the internal combustion engine, characterized in that each compressor cylinder unit is coordinated to a respective engine cylinder unit, means are provided for connecting the piston means of the respective compressor cylinder units and the respective piston means of the engine cylinder unit to a crankshaft of the internal combustion engine so that the piston means of the respective compressor cylinder units lead the piston means of the coordinated engine cylinder unit whereby, at a beginning of a compression stroke of the respective engine cylinder unit, the coordinated compressor cylinder unit supercharges the engine cylinder unit, connecting means for communicating the cylinder means of the coordinated compressor and engine cylinder units with each other, and in that the connecting means includes a first valve means adapted to be controlled in correspondence with an operating condition of the internal combustion engine, and a second valve means adapted to be opened in the presence of a required supercharging pressure.

4,191,153

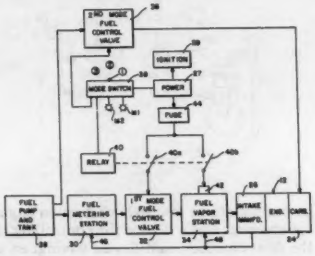
ASSEMBLY AND METHOD OF VAPORIZING LIQUID GASOLINE FUEL AND SYSTEM

Robert C. Strem; R. C. Strem, both of Newcastle, and John H. Eberle, Colfax, all of Calif., assignors to Omnewtronics, Inc., Carson City, Nev.

Continuation-in-part of Ser. No. 843,799, Oct. 20, 1977. This application Dec. 1, 1977, Ser. No. 856,494

Int. Cl.[2] F02M *17/22*

U.S. Cl. 123—133 **1 Claim**



1. In a system for feeding gasoline fuel in a vapor state into a gasoline burning internal combustion engine, an assembly for converting liquid gasoline to said vapor state, comprising:

(a) a housing defining an internal chamber and including:

(i) Air inlet means,

(ii) liquid gasoline inlet means, and

(iii) fuel outlet means;

(b) a first plurality of gasoline supporting plates fixedly located within said chamber in a spaced-apart, longitudinally aligned array starting with a first one of said first plates, the porosity of said plates to the passage of air therethrough successively increasing starting with said first one;

(c) a second plurality of gasoline supporting plates fixedly located within said chamber in a spaced-apart, longitudinally aligned second array located adjacent to and longitudinally aligned with said first plates, each of said second plates having a predetermined porosity to the passage of air therethrough;

(d) means associated with each of said first plates for applying predetermined amounts of liquid gasoline onto its associated first plate for vaporization thereon, the amount of liquid gasoline being applied to said first plates successively decreasing starting with said first one of said first plates, said gasoline applying means associated with each of said first plates including

(i) a longitudinally extending channeled member opening upwards and having a plurality of longitudinally spaced apertures along its bottom edge, said channeled member

being supported within said chamber above said associated gasoline supporting plate, and

(ii) means for directing liquid gasoline into said channeled member at least at two longitudinally spaced points through said liquid gasoline inlet means, said gasoline passing through said apertures and onto its associated plate,

(e) means for directing a stream of air into said chamber through said air inlet means; and

(f) means for directing said stream of air successively through said first plates during said vaporization, whereby said vaporized gasoline is entrained by and carried with said stream, thereafter successively through said second plates, whereby any liquid gasoline entrained in said stream is captured by said second members for vaporization thereon, and thereafter out of said chamber through said fuel outlet means, said air stream directing means including an air directing baffle plate associated with and located directly in front of each of said gasoline support plate, said baffle plates together directing said air stream alternately towards one edge section of a given one of said plates and towards an opposite edge section of a next, adjacent plate as said stream passes through successive plates.

4,191,154

EVAPORATED FUEL VAPOR CONTROL DEVICE FOR USE IN AN INTERNAL COMBUSTION ENGINE

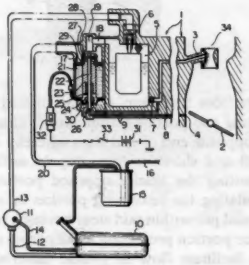
Norio Shibata, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Feb. 3, 1978, Ser. No. 874,757

Claims priority, application Japan, Aug. 29, 1977, 52-114467[U]

Int. Cl.² F02M 7/20

U.S. Cl. 123—136 **6 Claims**



1. An emission control device of an internal combustion engine having an intake passage with a throttle valve therein, said device comprising:

a carburetor having a float chamber and a slow fuel passage fluidly communicating said intake passage with the lower interior of said float chamber, which is filled with liquid fuel, said float chamber having therein an upper air space;

a canister containing an active charcoal therein;

an evaporated fuel vapor passage fluidly communicating said canister with the upper air space of said float chamber;

a single valve device in said slow fuel passage and in said evaporated fuel vapor passage, said valve device normally closing said slow fuel passage and substantially simultaneously opening said evaporated fuel vapor passage; and

means for actuating said valve device to open said slow fuel passage and substantially simultaneously close said evaporated fuel vapor passage when the engine is operating.

4,191,155

INTERNAL COMBUSTION ENGINE IGNITION NOISE PREVENTING DEVICE

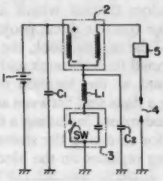
Kanemitsu Nishio; Mitsutaka Yoshida; Takashi Suzuki, and Junji Sunohara, all of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Nov. 17, 1977, Ser. No. 852,259

Claims priority, application Japan, Nov. 25, 1976, 51-141439; Dec. 2, 1976, 51-145406; Dec. 2, 1976, 51-145407; Dec. 2, 1976, 51-161974[U]

Int. Cl.² F02P 1/00

U.S. Cl. 123—148 P **6 Claims**



1. In an internal combustion engine ignition device, said ignition device being of the type having a low voltage side circuit including a D.C. power source, the primary of an ignition coil and an interrupter means connected in series with said primary and said D.C. power source, and a high voltage side circuit including the secondary of said ignition coil, a spark plug and a radio noise preventing means for suppressing a capacity discharge current in said high voltage side circuit, the improvement comprising:

radio noise preventing means in said low voltage side circuit for suppressing a capacity discharge current flowing through said low voltage side circuit, said radio noise preventing means in said low voltage side circuit comprising an inductor connected in series between said primary and said interruptor and a capacitor connected in parallel to the series connection of the inductor and interruptor.

4,191,156

TWO-STROKE, WATER-COOLED INTERNAL COMBUSTION ENGINE HAVING THE CYLINDER LINERS REMOVABLE FROM THE CYLINDER BLOCK

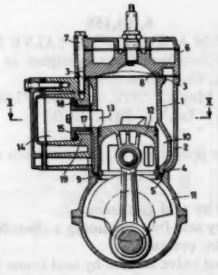
Carlo Doveri, Pontedera, Italy, assignor to Piaggio & C. S.p.A., Genoa, Italy

Filed Dec. 20, 1977, Ser. No. 862,761

Claims priority, application Italy, Dec. 30, 1976, 31023 A/76

Int. Cl.² F01N 7/10

U.S. Cl. 123—193 C **17 Claims**



1. In a two-stroke internal combustion engine of the compression crankcase type: an engine block having at least one cavity which defines a seating with a substantially annular bottom wall and with a discrete number of spaced apart lateral

resting surfaces formed in correspondence with the top surface of the engine block; an engine head releasably attached to the top surface of the engine block, the annular bottom wall receiving in sealtight manner the lower edge of an inserted cylinder liner, the exterior surface of said liner forming with the engine block a cooling jacket and the top edge of the liner being laterally received on said resting surfaces and confined at its top by a surface which is substantially coplanar with the top surface of the engine block so as to receive in a sealtight manner the engine head, the liner having transfer ducts formed therethrough in portions of the liner which project laterally outward of the remainder of the liner, said resting surfaces of the engine block receiving the top edge of the liner in correspondence with sectors thereof which are spaced from the areas from which the transfer ducts project, so that the liner can be slipped out of the engine block, the liner having at least one exhaust port formed therethrough and the block having an exhaust duct disposed at the location of the exhaust port, means for providing a tight seal between said exhaust port and said exhaust duct, said means including a fitting in the form of a sleeve and means for clamping the sleeve to the liner and to corresponding resting surfaces on the block.

4,191,157

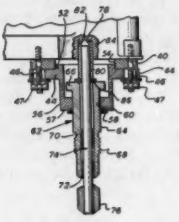
MAGNETO DRIVE ADAPTER

David L. Shaw, 103 Washington St., Morristown, N.J. 07960

Filed Sep. 7, 1978, Ser. No. 940,291

Int. Cl.[2] F02B *77/14*; F02P *1/04*; H02K *7/10*

U.S. Cl. 123—198 R **2 Claims**



1. In combination, a motorcycle engine including a cam casing having a drive take-off port and a drive gear, a magneto drive shaft mounted in said port and connected with said drive gear, a housing for rotatably supporting said drive shaft, first and second plates respectively secured to said cam casing and to a magneto, for supporting said magneto on the cam casing, and means for adjustably securing said first and second plates together for angular adjustment relative to each other for changing the timing of said magneto.

4,191,158

GAS FIRED GUN AND PLASTIC VALVE THEREFOR

Roger J. Curran, Stratford, Conn., assignor to Bangor Punta Operations, Inc., Greenwich, Conn.

Filed May 17, 1977, Ser. No. 797,883

Int. Cl.[2] F41B *11/06*

U.S. Cl. 124—76 **28 Claims**

1. Apparatus for propelling a projectile from a gun comprising:

a gun frame,

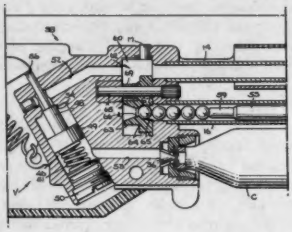
a barrel carried by said gun frame,

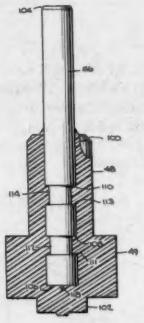
means carried by said frame defining a chamber for containing a gas under pressure,

a normally closed valve carried by said frame for storing gas in said chamber under pressure,

means carried by said frame for opening said valve and releasing gas from said chamber to propel the projectile along said barrel,

said valve including a valve seat, an elongated valve stem and an elongated pin carried by said stem, said pin having an end portion projecting from one end of said stem, said stem being formed of a plastic material wholly encapsulating the remaining portion of said pin, said stem having a sealing surface adjacent said one stem end engageable with said valve seat, said pin being generally cylindrical throughout its length and having a different diameter portion in said remaining pin portion defining a shoulder axially spaced from the projecting end portion of said pin, said shoulder lying wholly within said stem and facing in a direction opposite to the direction said pin end portion





projects from said stem, the end of said pin opposite its projecting end portion terminating within said stem short of the opposite end of said stem whereby said opposite pin end and said shoulder form impact surfaces within said stem butting the axially opposed portions of said stem encapsulating the remaining portion of said pin, and the end of said pin within said stem having a reduced diameter deflector portion projecting axially from said opposite pin end to facilitate flow of plastic material about the pin during injection molding of said stem with said pin.

4,191,159

SYSTEM FOR SLICING SILICON WAFERS

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Earl R. Collins, La Canada, Calif.

Filed Oct. 16, 1978, Ser. No. 951,828

Int. Cl.[2] B28D *1/08*

U.S. Cl. 125—21 **9 Claims**

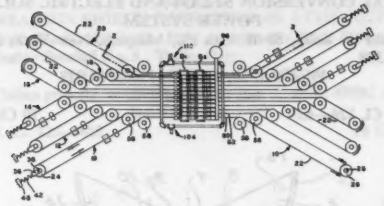
1. In a system including a cutting station for slicing a plurality of silicon wafers simultaneously from a plurality of boules during a single cutting operation, the improvement comprising:

A. a ganged band saw including a plurality of endless band saw blades supported for simultaneous operation and arranged in side-by-side coplanar relation;

B. means for imparting simultaneous unidirectional linear travel to each of said blades;

C. means adjacently related to a cutting station for simultaneously feeding to said ganged band saw a plurality of boules of silicon arranged in spaced coplanar relation;

D. means for reducing blade wobble including a plurality of guide means disposed in juxtaposition with the cutting station for receiving said blades in supported relation,



each of said guide means being characterized by a pair of coaxially spaced disks supported in engaged relation with opposite side surfaces of one blade of said plurality; and

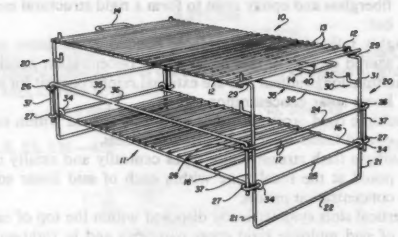
E. means for angularly advancing said pair of disks in a direction opposing said unidirectional travel at a linear speed less than the rate of unidirectional travel of the blade.

4,191,160

COLLAPSIBLE BARBECUE

William G. Elliott, Smiths Falls, Canada, assignor to Roger's Plating Limited, Ontario, Canada

Filed Dec. 19, 1977, Ser. No. 862,040
Int. Cl.² F24B *3/00*
U.S. Cl. 126—9 R **8 Claims**



1. A collapsible cooking rack arrangement, comprising:

a first wire rack for supporting food to be cooked;

a second wire rack for supporting a heat source;

a pair of end supports for holding said first and second racks in mutually vertically spaced relationship;

said end supports each including means for releasably supportingly engaging said first rack, whereby said rack is readily removable from said end supports;

means for pivotally connecting said end supports to opposite respective ends of said second rack at points intermediate the tops and bottoms of said end supports, whereby said end supports are pivotable relative to said second rack between collapsed positions, in which said end supports are compactly folded with said second rack, and erected positions, in which said second rack is raised above the bottoms of said end supports to provide ground clearance and said engaging means are engageable with said rack; and

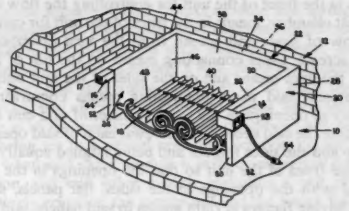
means for locking said end supports in the erected positions.

4,191,161

FIREPLACE HEATER

William E. Kling, 6647 Tanglewood Dr., SE., Grand Rapids, Mich. 49506

Filed Nov. 21, 1977, Ser. No. 853,267
Int. Cl.² F24B *7/00*
U.S. Cl. 126—121 **5 Claims**



1. A fireplace heater for placement in a solid fuel burning fireplace, the fireplace heater comprising:

a conduit comprising a heat conducting material forming a container shaped with rear and first and second side sections to substantially define a central area for placement of a fire;, a bottom portion extending along the rear and side sections of the container and containing a substantial depth of water along the substantially entire length of the conduit, and an upper portion above the bottom portion, an inlet opening extending through the upper portion of the conduit for receiving ambient air and located at a front end of said first side section, and an outlet opening extending through the upper portion of the conduit for discharging air therefrom and located at a front end of said second side section;

at least one wall of the bottom portion of the conduit having a heat exchange wall for transferring heat from the fire directly to water in said bottom portion; and

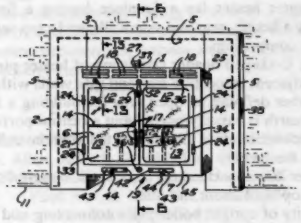
means for circulating air through the inlet, upper portion, and outlet; the circulating air passing over the water in the bottom portion to pick up heated water vapor as the air passes through the upper portion, whereby heated moist air is passed into a room adjacent the fire-place.

4,191,162

ENERGY SAVING AIR-FLOW HEATER

Donald S. Simms, Brattleboro Rd., Box 355, Rte. 1, Leyden, Mass. 01301

Filed Nov. 23, 1977, Ser. No. 854,414
Int. Cl.² F24B *5/02*
U.S. Cl. 126—123 **2 Claims**



1. A unit for generating hot air to circulate in a room comprising of: a heat chamber, two borosilicate glass doors adapted to contract and expand from the heat, located in the front of the unit, hinge means adapted to contract and expand from the heat generated in the heat chamber mounting said doors on the front of the heat chamber, an outer enclosed

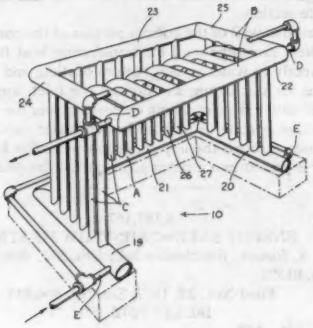
sleeve duct means located near the top and rear thereof whereby the velocity of the flow of air is caused to increase, openings below the heat chamber at the base of the unit and below the doors for permitting air to enter said outer enclosed sleeve duct, an opening in the top of said unit above the heat chamber for permitting heated air to flow from said outer sleeve duct means, a reduced cross-section in said sleeve duct means that causes the heated air to flow at a high velocity, means in the front of the unit for controlling the flow of air to the heat chamber, means in the front of the unit for controlling the flow of gases and smoke from the heat chamber, sheet metal screws, panel connecting means on the top of the unit above the duct means and on the sides of the unit outside the duct means, said panel connecting means comprising of a plurality of openings in the outer surfaces of said unit adapted to receive the said sheet metal screws, each of said openings at the top and the sides thereof and being aligned equally distant from the front of the unit so that the openings in the top are aligned with the openings in the sides, flat panels, said flat panels having flanges at right angles to said panels, said flanges having openings, said flanges adapted to rest on said openings in the unit at the top and sides thereof and adapted to align with the openings at the top and the sides of the unit aforesaid in predetermined positions, whereby sheet metal screws may secure said panels in the same plane whereby the area behind the said panels is hidden from view and whereby if the fireplace is small or large, the panels can be positioned in abutment with the face of the fireplace.

4,191,163

FIREPLACE WATER HEATER

Henry G. Ballard, Rt. 9, Box 151, Easley, S.C. 29640

Filed Feb. 6, 1978, Ser. No. 875,387
Int. Cl.[2] F24B 9/04
U.S. Cl. 126—132 **2 Claims**



1. A water heater for a fireplace having a fire chamber defined by a hearth, rear and side walls, and a top wall containing a flue comprising:

a lower U-shaped header consisting of heater pipes extending adjacent respective rear and side walls within said fire chamber defining an open area for building a fire so that the hearth is entirely open about a central portion thereof to accommodate a fire supported therein entirely apart from the heater;

an upper heater extending adjacent a marginal portion of said top wall about the flue;

a plurality of upright boiler pipes connecting said lower and upper headers spaced along said rear and side walls;

a first number of said boiler pipes along said rear wall extending substantially vertically upwardly from said lower header connecting with a rear portion of said upper header and a second number of said boiler pipes alternating with said first number extending diagonally across said fire chamber connecting with a front portion of said upper head simultaneously communicating water flow from said lower header with said front and rear portions of said upper header enhancing efficient transfer of heat; and

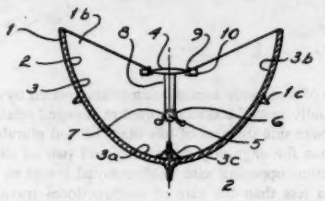
connections for supplying water to flow through said water heater.

4,191,164

DUAL CONVERSION STEAM AND ELECTRIC SOLAR POWER SYSTEM

Donald A. Kelly, 58-06 69th Pl., Maspeth, New York, N.Y. 11378

Filed Oct. 20, 1976, Ser. No. 734,028
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—439 **10 Claims**



1. A dual conversion stream and electric solar power system with linear solar concentration comprised of three geometric blended shapes,

a base parabolic reflector section symmetrical about a vertical centerline,

and blended with two equal and opposite side radial reflective, sections blended into the outer edges of said base parabolic reflector sections,

two equal and opposite concave reflective elongate strips disposed adjacent to the bottom centerline of said linear solar concentrator panels,

said linear solar concentration panels contructed of builtup fiberglass and epoxy resin to form a rigid structural member,

highly reflective mirror surfaces bonded to the inner contoured surface of said linear solar concentration panels,

multiple longitudinal ribs are external reinforcement for said linear solar concentration panels,

multiple rigid cross partitions uniformly spaced within each of said linear solar concentration panels,

multiple flash stream boiler pipes centrally and axially disposed at the focal zone within each of said linear solar concentration panels,

vertical slots symmetrically disposed within the top of each of said multiple rigid cross partitions and in right-angle relationship to said multiple flash stream boiler pipes,

multiple wire forms loops retaining said flash boiler pipes onto each of said multiple rigid cross partitions,

fastening means for said multiple wire form loops onto said multiple rigid cross partitions,

multiple linear convex lenses disposed between said multiple rigid cross partitions,

metal tracks supporting said multiple linear convex lenses disposed between and supported by said multiple rigid cross partitions,

said multiple linear convex lenses dispoed centrally above said flash stream boiler pipes,

connection of one end of said multiple flash stream boiler pipes to a cold water header pipe, connection of the opposite end of said multiple flash stream boiler pipes to a steam header pipe,

connection of said cold water header to a pressurized cold water supply source,

connection of said stream header pipe to a steam engine-coupled to a 110 volt alternator,

multiple solar photovoltaic cells arrayed in a square-form

pattern around and in tangent contact with the top and bottom and side of said flash stream boiler pipes,

said multiple solar photovoltaic cells disposed adjacent to the cold water entrance end of said flash stream boiler pipes,

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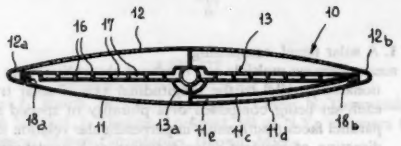
4,191,165

BREAKSUN SHIELD OPERATING AS A COLLECTOR

Ernesto Faudarole, Turin, Italy, assignor to Stars Stampaggio Resine Speciali S.p.A., Turin, Italy

Filed Dec. 1, 1977, Ser. No. 856,224
Claims priority, application Italy, Dec. 3, 1976, 69892 A/76
Int. Cl.² F24J 3/02
U.S. Cl. 126—445 **14 Claims**



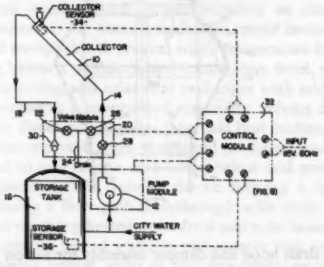
1. In a sun shield for building external facades and of the type comprising a plurality of orientable pallets, an improved pallet having the double function of a sun shield and a collector of solar energy, is made of polymeric material and includes an external shell having a lenticular cross-section and formed by extrusion, at least one transparent wall, an inner collector which is divided internally into separate cells extending longitudinally of the pallet and at least the surfaces of which are adapted to act substantially as a black body and two collecting heads for the delivery and recycling of an intermediate fluid to be heated by solar energy incident on the pallet, said collecting heads being sealingly connected to the upper and lower ends of said external shell.

4,191,166

SOLAR HEAT SYSTEM

Myrl J. Saarem; Donald E. Lovelace; Dale C. Firebaugh, and Dale F. Soukup, all of Carson City, Nev., assignors to Richdel, Inc., Carson City, Nev.

Filed Dec. 27, 1977, Ser. No. 864,719
Int. Cl.² F24J 3/02; F16K 31/44
U.S. Cl. 126—430 **7 Claims**



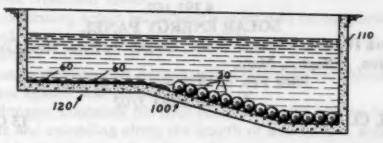
1. In a solar water heater system which includes a collector, a storage tank, a circulating pump, and pipeline means intercoupling the collector, storage and circulating pump to enable the pump to circulate a fluid through the collector to be heated therein, and returned to the storage tank, said pipeline means including a supply line extending from the pump to the collector and a return line extending from the collector to the storage tank; the combination of: a drain line, an electrically energized valve module coupling the pipeline means to the drain line, and a control module connected to the valve module for selectively establishing the valve module in an energized operating condition in which a circulating path for the fluid is established from the pump through the collector to the storage tank, and for selectively establishing the valve module in a de-energized operating condition in which the fluid in the collector is discharged through the drain line; said valve module including electrically activated means for selectively establishing the valve module in its energized operating condition in response to an electric signal from the control module, and spring means for establishing the valve module in its de-energized operating condition in the absence of such electrical signal, and said valve module further including a first valve interposed in the supply line, said first valve being set to an open operating position by said electrically activated means when said valve module is in its energized operating condition, and said first valve being set to a closed operating position by said spring means when said valve module is in its de-energized operating condition, and said valve module including a pair of valves respectively coupling the supply line and the return line to the drain line, said pair of valves being set to a closed position by said electrically activated means when said valve module is in its energized operating condition, and said pair of valves being set to an open position by said spring means when said valve module is in its deenergized operating condition.

4,191,167

SOLAR ENERGY FLUID HEATER

Vladimir Ignatjev, 39 Ledgewood Dr., Norwalk, Conn. 06850

Continuation-in-part of Ser. No. 786,082, Apr. 11, 1977, abandoned. This application Jun. 16, 1977, Ser. No. 807,004
Int. Cl.² F24J 3/02
U.S. Cl. 126—417 **5 Claims**



1. Apparatus for absorbing solar energy and heating fluid therewith comprising

a container of fluid through which the sun's rays can pass, said container having a bottom wall,

in said container, a plurality of thin-walled, dark-colored, hollow members, each having a plurality of apertures in its wall through which fluid can flow into and out of the interior thereof, said members being positioned to receive the sun's rays and to become heated thereby and to thereby heat the fluid in said container by contact and by radiation,

said hollow members each being secured to a plate which is seated on said bottom wall and provides a thermal insulating action between said bottom wall of said container and said hollow member.

4,191,168

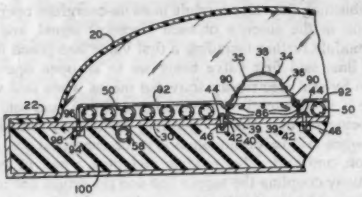
SOLAR ENERGY CONVERTING APPARATUS

Peyton S. Allen, R.R. 1, Grabill, Ind. 46741, and Norman G. Bell, 628 Stratton Rd., Fort Wayne, Ind. 46825

Filed Nov. 2, 1977, Ser. No. 847,724
Int. Cl.² F24J 3/02
U.S. Cl. 126—441 **15 Claims**

1. Solar energy conversion apparatus comprising a flat plate of thermally conductive material, a planar heat-absorbing device in the form of a flat spirally wound coil of tubing superposed on said plate, said coil having an open space centrally thereof which receives a radiation-reflective member, a cover element transmissive of solar radiation disposed in spaced relation over said device and peripherally mounted on said

plate thereby defining a dead-air space therewith, a flat base of material of low thermal conductivity, said plate being superposed on said flat base, means for securing said plate, said base, said cover element and said heat-absorbing device together, said cover elements including a material that is also reflective of some of the solar radiation whereby radiation reflected from objects within said dead-air space onto said cover element is



further reflected internally thereby contributing heat energy to the air within said space, to said cover element, to said heat absorbent element and to said plate, said coil having opposite ends to which fluid-conducting connections may be made, said tubing interiorly having at least one inwardly projecting helically extending vane which imparts rotation to fluid circulated through said tubing.

4,191,169

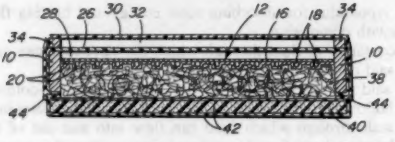
SOLAR ENERGY PANEL

Mark Hyman, Waltham, Mass., assignor to Solar Heat Corporation, Arlington, Mass.

Filed Feb. 6, 1978, Ser. No. 875,161

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—444 **13 Claims**



1. A solar energy panel comprising:

a frame;

an absorber plate mounted to the frame, the absorber plate including means defining flow passages for a fluid medium and for communicating said fluid medium to and from the fluid passages;

a first glazing attached to and extending across the frame, above and in spaced relation to the absorber plate, said first glazing comprising a film of plastic material which is substantially transparent to solar energy;

a second glazing attached to the frame and extending over the first glazing in spaced relation to the first glazing, said second glazing being formed from a film of plastic material which is substantially transparent to solar energy, said second glazing extending downwardly along the outside surfaces of the frame in surrounding relation to the frame; and

a bottom film of plastic material covering the bottom of said panel and being integral and continuous with the second glazing to encase the entire panel within protective plastic material.

4,191,170

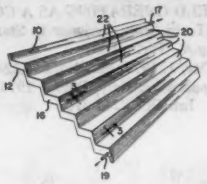
SOLAR PANEL

David R. Carrell, P.O. Box 895, Yakima, Wash. 98907

Filed Oct. 21, 1977, Ser. No. 844,421

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—449 **15 Claims**



1. A solar panel, comprising:

means forming multiple sets of planar absorptive faces positionable parallel to the longitudinal axis of solar travel, each set being composed of a plurality of spaced apart parallel faces positionable in perpendicular relation to the direction of incident solar radiation at a predetermined discrete solar position;

means operatively associated with said faces forming a series of closed-ended parallel flow channels underlying said faces in thermally conductive relation therewith;

means operatively connecting adjacent channels intermediate the ends thereof to transmit a heat exchange fluid between adjacent channels;

fluid inlet means operatively connected with one channel; and

fluid outlet means operatively connected with another channel.

4,191,171

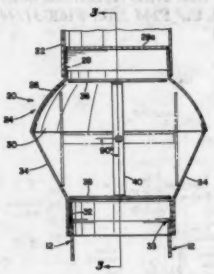
DRAFT HOOD AND DAMPER ASSEMBLY FOR FUEL FIRED HEATING APPARATUS

John J. Primeau, 19800 Seminole, Euclid, Ohio 44117

Filed Mar. 29, 1978, Ser. No. 891,320

Int. Cl.[2] F23L *3/00*; F16K *1/00*

U.S. Cl. 126—292 **11 Claims**



7. A draft hood and damper assembly for use on a fuel fired heating apparatus said assembly including a flared draft hood forming member having an outlet end of a first diameter and an inlet end of a second diameter larger than said first diameter, a tube member having an outlet end of a diameter substantially less than said second diameter and generally axially aligned with said hood member and spaced from said inlet end to define a generally annular flow space about said tube to the inlet of said hood forming member; a first damper member having a configuration and size to conform to the outlet of said draft hood forming member; a second damper member having a configuration and size to conform to the outlet of said tube

member; rotatable shaft means extending in a direction transverse to the outlet of said draft hood member; mounting means connecting said first and second damper members to said shaft means in spaced apart relationship on opposite sides thereof; and actuating means for selectively rotating said shaft means from a first position to respectively prevent flow through the outlet of said hood forming member and the outlet from said tube member to a second position wherein said damper members are spaced laterally of the outlet from said hood forming member and the outlet from said tube member.

4,191,172

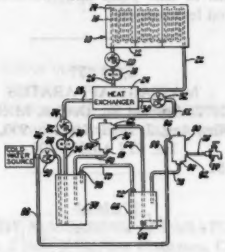
THERMOSTATIC MIXER VALVE

Robert L. Walch, Jr., Newfane; Van P. Carey, N. Tonawanda, and Michael J. Thomas, Lockport, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed May 19, 1978, Ser. No. 907,879

Int. Cl.² F24J *3/02*

U.S. Cl. 126—421 **2 Claims**



1. A solar energized hot water system comprising: storage means for potable water including a reserve tank and an immediate-use tank, a source of unheated potable water; a solar heat collector; a solar heat exchanger having one pass connected with said collector and another pass connected with said unheated water source; means including an alternate heater responsive to the water temperature in said immediate-use tank and energizable to prevent water temperature therein from falling below a predetermined temperature level; means operably connecting said solar heat exchanger with said storage means including a temperature responsive valving device to alternately direct heated water from said heat exchanger to said immediate-use tank when above said predetermined temperature and to said reserve tank when below said predetermined temperature; said valving device forming a hollow housing defining a flow path therethrough with three openings, the first receiving heated water from said solar heater, the second for passing heated water to said reserve tank and the third for passing heated water to said immediate-use tank; a thermally responsive power element and valve portion to block flow between said first and said third ports and permit flow between said first and second ports when the water temperature is below the predetermined temperature and to permit flow between said first and third ports and block flow between said first and second ports when the water temperature is above the predetermined temperature, whereby omission of direct flow of cooler water to the immediate-use tank minimizes the energization of the alternate heater.

4,191,173

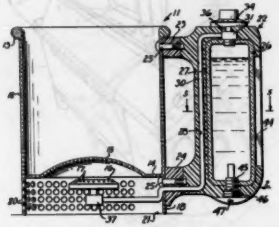
SELF-HEATING CUP

John R. Dedeian, 1616 156th NE., #241, Bellvue, Wash. 98007, and Charles Dedeian, 501, Soap Lake, Wash. 98851

Filed Jun. 12, 1978, Ser. No. 914,892

Int. Cl.² F24H *1/00*

U.S. Cl. 126—350 R **4 Claims**



1. A self-heating drinking cup comprising
an at least substantially cylindrical vessel for containing a beverage or the like,
a lip protecting cover of heat insulating material surrounding the inner and outer surfaces of the upper portion of said vessel,
said vessel having a bottom wall,
a hollow elongate handle of heat insulating material extending parallel to the length of said vessel,
spacing means of heat insulating material maintaining said handle in spaced apart relation to said vessel whereby said handle may be gripped to solely transport and pour or drink from said vessel,
means forming a skirt below said bottom wall for supporting said vessel on an underlying surface,
a burner,
means supporting said burner within said skirt for applying heat against said bottom wall,
an elongate container for fluid fuel within said hollow handle and extending along the length of said handle, and
a fluid conduit extending from the upper end of said container,
downwardly through said handle and through said spacing means to said burner.

4,191,174

INCUBATOR OPENINGS

Paul F. Martin, 86 Townsend Rd., Miramar, Wellington, New Zealand

Filed Dec. 13, 1977, Ser. No. 860,085

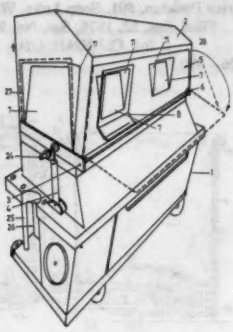
Claims priority, application New Zealand, Dec. 20, 1976, 182924

Int. Cl.² A61G *11/00*

U.S. Cl. 128—1 B **6 Claims**

1. An incubator including a cover means and means cooperating with said cover means for defining an enclosure within said cover means having sides and a top, means defining at least one access opening in a side of said cover means for allowing at least a person's arm to be extended through said side into said enclosure, said access opening having top, bottom, and side portions, rigid means movably disposed to the outside of said cover means to allow for opening and substantial closing of said access opening, means for providing said enclosure with an environment having a gas pressure above that externally of said enclosure, said means defining said at least one access opening including self-supporting canopy-like flange means projecting inwardly and downwardly of said enclosure at the top portion of said access opening and extending at least along upper parts of said side portions of said access opening, said flange means extending further into said enclosure at upper regions of said flange means than at lower regions of said

flange means whereby, opening said access opening will not allow any substantial rolling over by air from outside the



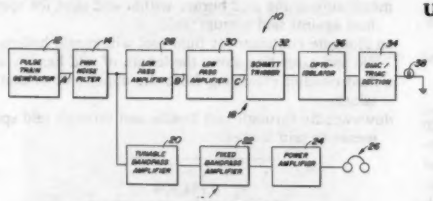
access opening into said enclosure to hence affect the incubator environment.

4,191,175

METHOD AND APPARATUS FOR REPETITIVELY PRODUCING A NOISE-LIKE AUDIBLE SIGNAL

William L. Nagle, c/o Seidel Gonda & Goldhammer, P.C. 600 Three Penn Center, Philadelphia, Pa. 19102

Filed Jan. 16, 1978, Ser. No. 870,050
Int. Cl.[2] A61B *19/00*
U.S. Cl. 128—1 C 10 Claims



1. Apparatus for repetitively producing a noise-like audible signal, comprising:

an audible signal source,

means for repetitively generating at a first adjustable repetition frequency bursts of digital pulses, said pulses within each burst having a second higher adjustable repetition frequency,

pink noise filter means connected to said pulse burst generating means for substantially attentuating all frequencies of said repetitive bursts of digital pulses above a first cutoff frequency and for accentuating a preselected range of lower frequencies.

tunable band pass filter means connected to said pink noise filter means for repetitively generating noise-like pulses of varying amplitudes, said tunable band pass filter means having a center frequency which is adjustable over a preselected range of frequencies which correspond to the frequencies optimally detectable by the average human ear, said noise-like signal having a frequency component accentuated at approximately said center frequency, and

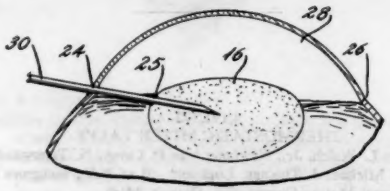
means connected to said tunable band pass filter means for driving said audible signal source.

4,191,176

INTRALENTICULAR CATARACT SURGERY

Joseph Spina, Bryn Mawr, Pa., and Michael K. Weibel, Redding, Conn., assignors to Novo Laboratories, Inc., Wilton, Conn.

Continuation-in-part of Ser. No. 771,551, Feb. 24, 1977, abandoned, which is a continuation-in-part of Ser. No. 660,873, Feb. 24, 1976, Pat. No. 4,078,564. This application Aug. 23, 1977, Ser. No. 827,100
The portion of the term of this patent subsequent to Mar. 14, 1995, has been disclaimed.
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—1 R 7 Claims



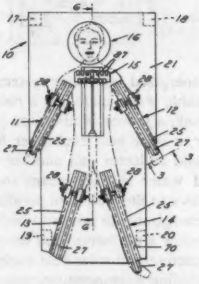
1. A method for enzymatically treating cataracts in vivo which comprises injecting a concentrated solution of a trypsin directly into the lens of an eye, then allowing enzymatic digestion of the lens to take place and thereafter removing the enzyme digested lens material.

4,191,177

MASSAGE APPARATUS

Tony Abbott, 26726 Student St., Detroit, Mich. 48239

Filed Aug. 2, 1978, Ser. No. 930,186
Int. Cl.[2] A61H *7/00*
U.S. Cl. 128—51 11 Claims



1. In a massage apparatus, the combination comprising:

(a) a support member having a support surface for supporting the body of a person on which the massage apparatus is to operate;

(b) a pair of arm massage units mounted on the support member for massaging the arms of a person laying on the support surface;

(c) a pair of leg massage units mounted on the support member for massaging the legs of a person laying on the support surface;

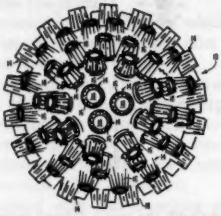
(d) a back massage unit mounted on the support member for massaging the back of a person laying on the support surface;

(e) each of said massage units including a plurality of massage rollers;

(f) means for moving said massage units;

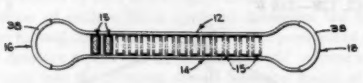
(g) each of said massage units including a pair of movable massage roller carrier members;
(h) a plurality of massage rollers operatively mounted on each carrier member; and,
(i) means for moving said pair of massage roller carrier members on each of said massage units toward each other for normally biasing the massage rollers on the carrier members against the part of a person's body on which the respective massage unit is operating.

4,191,178
MASSAGE DEVICE
Michael J. Wisnieski, 2863 Mission Blvd., San Diego, Calif. 92109
Filed Mar. 31, 1978, Ser. No. 892,304
Int. Cl.[2] A61H *15/00*
U.S. Cl. 128—57 **4 Claims**



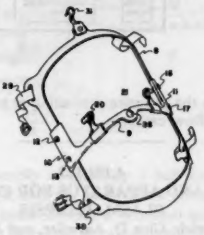
1. A massage device comprising:
a central core section;
a plurality of frustro-conic protuberances extending therefrom, said protuberances having an outer corrugated surface and a concave tip.

4,191,179
BODY MASSAGING APPARATUS
Alvin J. Mattila, 2 Beaver St., San Francisco, Calif. 94114
Filed Jan. 18, 1979, Ser. No. 4,404
Int. Cl.[2] A61H *11/00*
U.S. Cl. 128—58 **5 Claims**



1. Body massaging apparatus comprising first and second elongate flexible tension members, first and second handle means connected to opposite ends of said elongate members for affording a hand grip thereto and supporting said elongate members in substantial parallel spaced apart relation, a plurality of parallelly spaced apart massaging units extending between said elongate members and supported thereby, each said massager unit including a shaft having first and second ends secured to respective said elongate members and spanning the space therebetween, a substantially rigid cylindric member defining a central opening sized for rotative movement on said shaft and having an exterior surface concentric therewith, a flexible sheet adhesively secured to said cylindric surface, and a plurality of resilient fingers integral with and projecting radially from said flexible sheet, said fingers having width and thickness dimensions and a length dimension greater than said width and thickness dimensions so that in response to manipulation of the apparatus by grasping said handles said members can be rolled over parts of the body to cause said points to roll upon and stimulate the skin.

4,191,180
ENDOTRACHEAL SUPPORT AND STABILIZATION DEVICE
Donna J. Colley, and Michael L. Easterwood, both of 630 E. 24th St., San Angelo, Tex. 76903
Filed Mar. 24, 1978, Ser. No. 889,812
Int. Cl.[2] A61M *25/02, 16/00*
U.S. Cl. 128—207.17 **5 Claims**

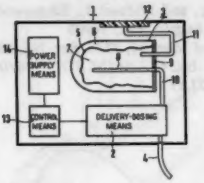


1. An endotracheal support and stabilization device for a person having a head with a face in front of the head and a back, the face having a forehead, a nose with nostrils and a chin, said endotracheal support and stabilization device comprising
a generally oval frame framing the face of a user, said frame having spaced opposite upper and lower parts and spaced opposite side parts substantially parallel to each other and a cross-member mounted transversely on the side parts of said frame and extending across the face of the user substantially perpendicular to said side parts at substantially the level of the nose, said cross-member being slidably mounted on said side parts of said frame for adjustment to different positions from said upper and lower parts of said frame according to different nose positions on different faces;
clamp means on said cross-member for securing external hoses to said cross-member in a manner whereby tubing from said hoses is maintained inserted into the nostrils of the user free from pressure on the nose; and
fastening means affixed to said frame and extendable around the back of the user's head for releasably supporting the frame in position framing the user's face with said cross-member extending across the user's nose, the upper part in the area of the forehead of the user and the lower part in the area of the chin of the user.

4,191,181
APPARATUS FOR INFUSION OF LIQUIDS
Manfred Franetzki, Uttenreuth; Karl Prestele, Erlangen, and Helmut Fünke, Möhrendorf, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany
Filed Oct. 26, 1977, Ser. No. 845,711
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1976, 2652026
Int. Cl.[2] A61J *7/00*; A61M *5/00*
U.S. Cl. 128—213 R **20 Claims**

1. A device for infusion of liquids into human or animal bodies comprising:
a reservoir means for infusion liquids isolated from a body being treated with such infusion liquid;
a delivery-dosing means operationally coupled to said reservoir means and to an outflow catheter adapted to be connected to a body being treated with the infusion liquid; and
a reduced-pressure generating means operationally engaged with said reservoir means which maintains a defined refer-

ence pressure value at the interconnection between said reservoir means and said delivery-dosing means which is



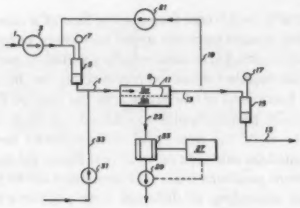
lower than the pressure prevailing at an outflow opening of said outflow catheter.

4,191,182

METHOD AND APPARATUS FOR CONTINUOUS PLASMAPHERSIS

Robert P. Popovich; Glen D. Antwiler, and Jack W. Moncrief, all of Austin, Tex., assignors to Hemotherapy Inc., Austin, Tex.

Filed Sep. 23, 1977, Ser. No. 836,214
Int. Cl.[2] A61M *1/03*
U.S. Cl. 128—214 R **24 Claims**



19. A continuous plasmapheresis process comprising:

(a) continuously withdrawing whole blood from the blood vessel of a donor and pumping said whole blood into the filtering chamber of an ultrafiltration cell;

(b) continuously filtering said whole blood into a cellular component fraction and a plasma fraction by passing it in a flow over and parallel to an ultrafilter membrane having a pore size of from about 0.1 to 1.0 microns in diameter, and at a flow rate sufficient to provide a shear stress at the membrane interface of from about 10 dynes/cm^2 to about 1000 dynes/cm^2 at transmembrane pressures of from about 50 mm of mercury to about 700 mm of mercury;

(c) continuously admixing said cellular component fraction with an amount of replacement fluid substantially equal to said separated plasma fraction; and

(d) continuously returning said cellular component fraction and replacement fluid mixture to a blood vessel of said donor.

4,191,183

MIXING CHAMBER FOR USE IN PLURAL MEDICAL LIQUID INTRAVENOUS ADMINISTRATION SET

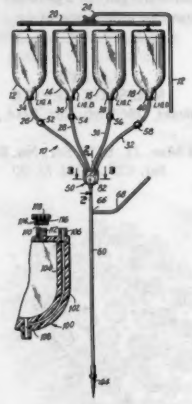
Barry Mendelson, 1 Topaz Ct., New City, N.Y. 10977

Filed Oct. 31, 1977, Ser. No. 847,263
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—214 R **7 Claims**

1. A mixing chamber for use in an intravenous administration set wherein plural medical liquids are delivered to a patient comprising a pair of opposed, substantially parallely extending front and rear walls, said walls being closely spaced to each other relative to their transverse dimensions, said walls each having top and side peripheral edges;

a top wall extending between and interconnecting the top peripheral edges of said front and rear walls, said top wall having a plurality of entry ports formed therethrough, each port communicating with the space defined between said front and rear walls; and

a side wall extending between and interconnecting the side peripheral edges of said front and rear walls, said side wall having an exit port formed therethrough, said exit port



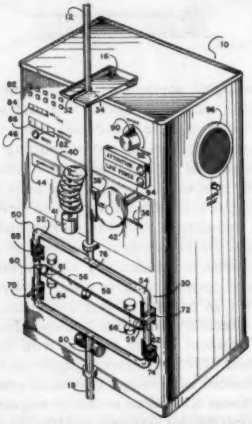
communicating with the space defined between said front and rear walls, whereby said front, rear, top and side walls define a relatively shallow interior chamber, said mixing chamber further including a bypass bore having upper and lower ends formed in said sidewall, the upper end of said bypass bore communicating with an entry port and the lower end of said bypass bore communicating with said exit port.

4,191,184

INTRAVENOUS INFUSION REGULATION SYSTEM WITH RECIPROCAL METERING MEANS

Jeffrey A. Carlisle, 30 Harris St., Acton, Mass. 01720

Continuation-in-part of Ser. No. 757,452, Jan. 6, 1977, abandoned. This application May 31, 1978, Ser. No. 911,280
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—214 F **4 Claims**



1. An intravenous infusion system capable of regulating flow

from an infusate fluid supply means through a disposable tubing supply network into animate bodies, most notably medical patients, comprising:

a reciprocal metering means allowing discrete, known quantities of said fluid to move at specific intervals through said disposable tubing supply network;

circuit means for regulating the frequency and number of said discrete fluid quantities passed into the patient;

means for selectively externally increasing the available driving pressure of said infusate;

means for monitoring fluid velocity during moments of infusion through said tubing means;

means for computing and displaying clinical status conditions based on said fluid velocity;

wherein said reciprocal metering means comprise:

a fluid volume control apparatus capable of receiving an inlet tube from an infusion supply means and an outlet tube connected to a cannula for infusion of fluids into animate bodies comprising:

a ported, divaricated delivery tube which receives and diverges into portions from said inlet tube and converges and receives said outlet tube;

a transverse volume control tube, ported at its ends, intermediately disposed between said diverging portions of said divaricated delivery tube, said diverging portions being ported therewith with said control tube having internal dimensions such that each infusion cycle will deliver less than 1.0 ml of infusate;

means associated with said diverging portions of said delivery tube for restricting and regulating fluid flow through said delivery tube being positioned such that said volume control tube port connections are interposed therebetween;

means for alternately operating said infusion flow regulation and restriction means in a diagonally paired tandem fashion;

a control member movably positioned in a substantially fluid tight relation within said control tube, and optical detection means positioned about each end of said control tube at the connection of said delivery tube portions for detection of said control member;

and wherein said means for monitoring fluid velocity during moments of infusion comprise:

electrical output means from said optical detectors which are measured by the controlling circuitry in relation to the initiation of each infusion cycle to determine the time taken for said control member to leave the presence of one said detector means and travel through said volume control tube into the presence of said detection means at the other end of said control tube;

and wherein said means for externally increasing the available driving pressure of said infusate fluid comprises:

a motor-driven eccentric means and an associated occluding means, such as a roller or peristaltic pump, for squeezing said inlet tube in a well-known time-space relationship, causing fluid to be propagated in a single direction through said tubing network;

an electromechanical switch to selectively activate and deactivate said motor-driven eccentric means and said associated occluding means;

and wherein said circuit means for regulating the frequency and number of said discrete fluid quantities delivered to the patient consists of a programmed microprocessor and associated interface and input/output circuit means;

and wherein said means for computing clinical status conditions provides distinct indications for infusion rate, volume infused, and abnormally slow flow through said volume tube.

4,191,185

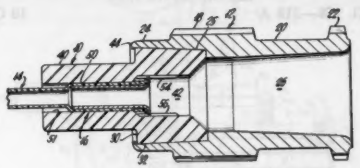
CATHETER ASSEMBLY

Francis P. Lemieux, Morristown, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Sep. 6, 1977, Ser. No. 830,933

Int. Cl.[2] A61M *5/00, 25/00*

U.S. Cl. 128—214.4 **5 Claims**



1. A catheter assembly comprising: a hub having an axial opening therethrough; catheter securement means including a color-coded plastic insert having a proximal section secured within the distal end of said axial opening and a distal section extending outwardly therefrom, said insert having a passageway extending therethrough in alignment with said axial opening; and a flexible hollow plastic catheter having a proximal portion secured within said passageway of said insert only, there being no direct contact between said catheter and said hub, said catheter having a distal portion extending beyond the distal end of said insert, said proximal portion of said catheter being secured within said passageway in fluid communication with said axial opening by an internal sleeve, having expanded only said proximal portion outwardly into locking contact with the internal surface of said distal section of said insert.

4,191,186

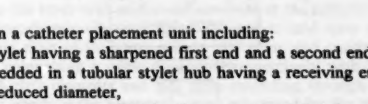
REMOVABLE DIGIT ENGAGEABLE MEANS FOR SEPARATING A CATHETER AND STYLET

Robert J. Keeler, Wheeling, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Dec. 12, 1977, Ser. No. 859,344

Int. Cl.[2] A61M *05/00*

U.S. Cl. 128—214.4 **10 Claims**



1. In a catheter placement unit including:

a stylet having a sharpened first end and a second end embedded in a tubular stylet hub having a receiving end of reduced diameter,

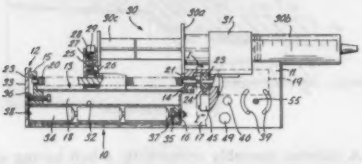
a flexible catheter slidably disposed over said stylet, a first end of said catheter terminating short of said sharpened first end of said stylet and tapering away therefrom and a second end of said catheter attached to a first end of a tubular catheter hub having a second end loosely and removably disposed over said receiving end of said stylet hub, said catheter hub having digit engageable means associated therewith for facilitating removal of said catheter hub from said stylet hub; the improvement which comprises:

said digit engageable means being removably associated with said catheter hub and removable quickly and easily therefrom by a single handed operation.

4,191,187
MEDICAL APPARATUS

Basil M. Wright, Rickmansworth, England, assignor to National Research Development Corporation, London, England

Filed Mar. 8, 1978, Ser. No. 884,545
Claims priority, application United Kingdom, Mar. 9, 1977, 09947/77
Int. Cl.² A61M 5/20
U.S. Cl. 128—218 A 10 Claims

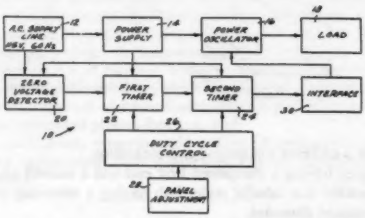


1. Syringe driving apparatus comprising an elongate support formed for securement therealong of the barrel of a syringe, an electric motor, a transmission assembly drivably coupled with said motor and engageable with the plunger of said syringe to move said plunger into said barrel, drive control means for repeatedly applying uniform electrical signals at an adjustable frequency to energise said motor by each such signal to produce a predetermined incremental movement of said plunger by said transmission system, and safety control means for inhibiting said drive control means in response to energisation of said motor thereby for a predetermined continuous period of time greater than the duration of each of said drive control signals during normal operation of the apparatus.

4,191,188
VARIABLE CREST FACTOR HIGH FREQUENCY GENERATOR APPARATUS

Kenneth W. Belt, Berwyn, and Stuart G. McCarrell, Chicago, both of Ill., assignors to Macan Engineering & Manufacturing Company, Inc., Chicago, Ill.

Division of Ser. No. 684,082, May 7, 1976, Pat. No. 4,100,505.
This application Sep. 9, 1978, Ser. No. 876,325
Int. Cl.² A61B 17/36; A61N 3/02
U.S. Cl. 128—303.13 15 Claims



1. A method of treating live tissues by applying a high frequency electrosurgical signal thereto, comprising the steps of:

receiving an input sinusoidal voltage;

generating repetitive pulses which are symmetrical in time with respect to and centered about peaks of the input sinusoidal voltage;

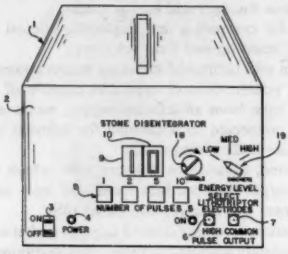
applying the input sinusoidal voltage and the repetitive pulses to a high frequency generator to turn the generator on and off and generate bursts of high frequency signals which are centered about the peaks of the input sinusoidal voltage; and

applying the signal bursts to an electrosurgical instrument.

4,191,189
STONE DISINTEGRATOR

Yale Barkan, 835 Amigos Way, No. 17, Newport Beach, Calif. 92660

Filed Oct. 19, 1977, Ser. No. 843,402
Int. Cl.² A61B 17/00
U.S. Cl. 128—328 7 Claims

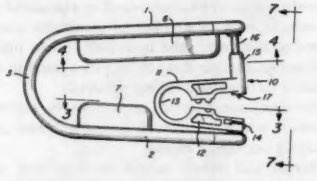


1. An instrument for disintegrating calculi in the urinary tract by hydraulic impacts formed by electrical discharges in the liquid medium surrounding the calculi including in combination a lithotrite for providing said electrical discharges, first and second spaced lithotriptor electrodes of said lithotrite, capacitor means, a high voltage relay for selectively connecting and disconnecting said lithotriptor electrodes across said capacitor means; and when said relay has disconnected said lithotriptor electrodes, said electrodes are electrically isolated from the capacitor means; means for charging said capacitor means, including rectifying and filtering means, and control means for said relay, said contol means including a pulse generator of selectable pulse repetition rate, and input circuit means to said pulse generator including unipolar initiation signal transmission means, and isolation and threshold filtering means.

4,191,190
EARLOBE PIERCING INSTRUMENT HOLDER

John A. Hastings, 31 Main St., Bass River, Mass. 02664

Filed May 12, 1977, Ser. No. 797,808
Int. Cl.² A61B 17/00
U.S. Cl. 128—330 3 Claims



1. In combination, an earlobe piercing instrument and a holder for said instrument, said earlobe piercing instrument including a plunger adapted to engage the head of an earlobe piercing pin and means for supporting a locknut adapted to receive the pointed end of said pin after it has been projected through an earlobe, said holder comprising means for engaging said plunger and means for engaging said locknut supporting

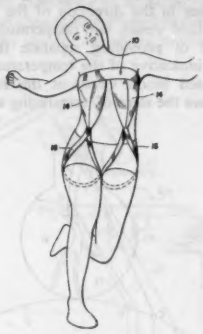
means for relative movement toward one another, said means for engaging said plunger and said means for engaging said locknut supporting means being positioned at the outermost ends of said plunger and said locknut supporting means, respectively, and means commonly supporting said plunger engaging means and said lockout supporting means, wherein said piercing instrument has a pair of jaws and means resiliently holding said jaws apart, said means resiliently holding said jaws apart also in part providing means for securing said instrument to said means commonly supporting said plunger engaging means and said locknut supporting means.

4,191,191
LAPROSCOPIC TROCAR
Robert M. Auburn, 2683 Surfrider Ave., Ventura, Calif. 93003
Filed Feb. 13, 1978, Ser. No. 877,270
Int. Cl.[2] A61B *17/34*
U.S. Cl. 128—347 **3 Claims**

1. A laproscopic trocar comprising:
an elongated cannula having an internal chamber, said cannula having a first opening providing access into said internal chamber and a second opening providing exit from said internal chamber;
an elongated instrument capable of being conducted through said first opening and into said internal chamber and through said second opening, the outer end of said instrument extending exteriorly of said second opening being sharp pointed, said outer end including a helical ridge, said helical ridge taking the form of a plurality of helical ridges forming a screw thread assembly, whereby said instrument to be inserted within said cannula with said sharp pointed outer end to make initial penetration through a patient's abdominal wall and subsequent rotation of said instrument causes gradual entry of said instrument into the patient's abdomen due to the threading of said helical ridge through the patient's abdominal wall, said screw thread assembly comprises a series of sharp pointed helical ridges and a series of smoothly contoured helical ridges, said sharp pointed helical ridges being located adjacent said sharp pointed outer end.

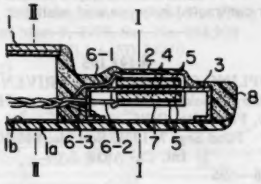
4,191,192
ATHLETIC BRASSIERE
Robert F. McDavid, Box 921, Terre Haute, Ind. 47808
Filed Mar. 30, 1979, Ser. No. 25,346
Int. Cl.[2] A41C *3/08*
U.S. Cl. 128—457 **6 Claims**

1. An athletic brassiere comprising an elastic chest band adapted to snugly encircle the chest of a wearer near the armpits and above the breasts, a pair of breast cups secured to the frontal portion of said chest band, and a pair of elastic straps attached to said cups and adapted to encicle the legs of a



wearer of the brassiere and exerting a downward pull on the cups which is resisted by the holding action of said chest band.

4,191,193
CATHETER HEAD-TYPE TRANSDUCER
Iwao Seo, Ibaragi, Japan, assignor to Mitsubishi Petrochemical Co. Ltd., Chiyoda, Japan
Filed Feb. 22, 1977, Ser. No. 770,782
Claims priority, application Japan, Feb. 29, 1976, 51/021431
Int. Cl.[2] A61B *5/02*
U.S. Cl. 128—675 **8 Claims**

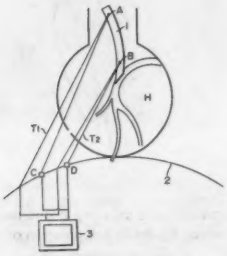


1. A catheter comprising a tube having a length and a tip, and a transducer on said tip which is comprised of a pair of organic high polymer filmlike piezoelectric elements being mounted on each opposite face of a rectangular shim having feet at each end fixed to and raising the piezoelectric elements from a relatively undeformable inner wall of the catheter tube so that said piezoelectric elements are centrally distorted in response to fluid pressure exerted on said tip, said shim being fixed to the inner wall of the catheter tube at the catheter tip, said piezoelectric elements being adhered to said shim with opposing sides of the same pole to said shim, and conductor means comprising a cable connected respectively with both piezoelectric elements and said shim extending through said tube to conduct the electrical signal generated by the transducer to means for receiving it.

4,191,194
BLOOD VESSEL TESTER
Toshio Watanabe, 1-28, Shirasagi 1-chome, Nakano-ku, Tokyo, and Yoshinori Tanimoto, 6, Kawada-cho, Shinju-ku, Tokyo, both of Japan
Filed Feb. 8, 1978, Ser. No. 876,138
Claims priority, application Japan, Feb. 14, 1977, 52-14718
Int. Cl.[2] A61B *5/02*
U.S. Cl. 128—692 **4 Claims**

1. A method for determining whether or not a transplanted

blood vessel inside a mammal is obstructed or contracted, in which a pair of temperature-sensitive elements are attached to the surface of said transplanted blood vessel at separate positions thereon which positions are longitudinally spaced-apart from each other in the direction of the blood flow of said transplanted blood vessel, said temperature-sensitive elements being capable of providing separate thermoelectromotive force outputs indicative of the temperature of the surface of said transplanted blood vessel at the respective positions, which comprises the steps of: transfusing a quantity of a cool-



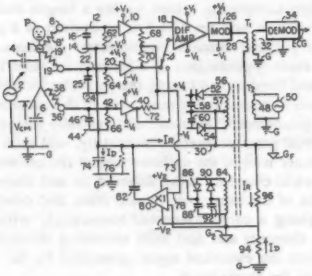
ing liquid into the blood that flows through said transplanted blood vessel at a location in the blood flow path upstream from said temperature-sensitive elements so that said temperature-sensitive elements thereby provide thermoelectromotive force outputs in response to the flow of the cooling liquid past said positions, each of said outputs varying with time and said two outputs being spaced-apart in time from each other; and measuring the time difference between corresponding points of said thermoelectromotive force outputs which time difference indicates whether or not said transplanted blood vessel is obstructed or contracted between said positions.

4,191,195

COUPLING CIRCUIT WITH DRIVEN GUARD

Arthur Miller, Brookline, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 7, 1978, Ser. No. 940,404
Int. Cl.² A61B 5/04
U.S. Cl. 128—696 **2 Claims**



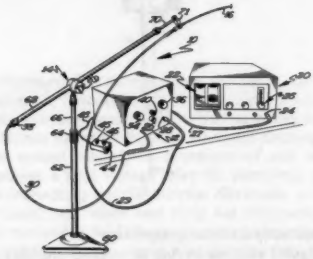
1. In combination,
a coupling circuit referred to a point of floating ground potential for transferring the difference between electrical signals supplied by electrodes on a patient's body to circuits referenced to true ground,
a unity gain buffer amplifier having an input and an output,
means coupling potentials on said coupling circuit to said input of said unity gain amplifier,
means for alternating current coupling said output of said unity gain amplifier to a point of floating ground potential,
a power supply for providing direct current operating potentials to said unity gain amplifier that are referenced to a given point,
a first impedance connected between said given point and true ground, said impedance having sufficient value to protect a patient from electrical shock, and
a second impedance connected between said given point and the point of floating ground reference of the coupling circuit.

4,191,196

PROFILOMETRY METHOD AND APPARATUS

William E. Bradley; Gerald W. Timm; William M. Klatt, all of Minneapolis, and Wayne H. Graves, Minnetonka, all of Minn., assignors to American Medical Systems, Inc., Minneapolis, Minn.

Filed Jun. 15, 1976, Ser. No. 696,318
Int. Cl.² A61B 5/10
U.S. Cl. 128—733 **5 Claims**



1. A diagnostic profilometry method comprising the steps of:
generating a urethral pressure profile, said generating step including the steps of:
catheterizing a patient with a urethral catheter having a plurality of electrodes mounted thereon;
inputting fluid through said catheter into the urethra;
withdrawing said catheter from the urethra; and
measuring and recording intra-urethral fluid pressure as said catheter is withdrawn; and
generating a urethral electromyographic profile simultaneously with the generation of said urethral pressure profile as said catheter is withdrawn by monitoring urethral electrical activity with said plurality of electrodes mounted on said urethral catheter and recording said urethral electrical activity.

4,191,197

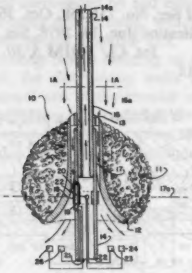
TOUCH FREE TYMPANIC THERMOMETER

Theodor H. Benzinger, 6607 Broxburn Dr., Bethesda, Md. 20014

Filed Mar. 14, 1978, Ser. No. 886,705
Int. Cl.² G01K 7/00
U.S. Cl. 128—736 **20 Claims**

4. A touch-free tympanic thermometer comprising a tube

passing heated air of a temperature close to tympanic temperature onto a tympanic membrane and from a thermoelectric



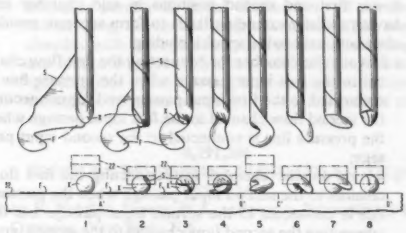
probing tube, and means measuring the temperature of the air returning outside the tubing yet while inside the ear canal.

4,191,198

CIGAR HEAD WRAPPING MECHANISM

Michael E. Chopko, and Hans C. Dreher, both of Dallas, Pa., assignors to Culbro Corporation, New York, N.Y.

Filed Jun. 2, 1977, Ser. No. 802,668
Int. Cl.[2] A24C *1/30, 1/32*
U.S. Cl. 131—76 **15 Claims**



1. An apparatus adapted to wrap a wrapper strip around a cigar bunch with a shaped head by rolling said bunch over said strip while said strip is on a supporting surface, in combination with a mechanism for pressing the tail portion of said strip onto said head during said rolling of said bunch which comprises a conveyor having a portion movable along said supporting surface, and a header block carried by said conveyor into contact with said head while said tail portion is being wrapped around said head, said block having a shaped face to make conforming contact with said head.

4,191,199

APPARATUS AND PROCESS FOR RECLAIMING TOBACCO

James W. Sullivan, Glendale, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Apr. 3, 1978, Ser. No. 892,450
Int. Cl.[2] A24C *5/36*
U.S. Cl. 131—96 **18 Claims**

10. Apparatus for reclaiming tobacco from cigarettes which comprises;

a rotatable cylinder having a first open end and a second open end and a bore communicating between the ends;

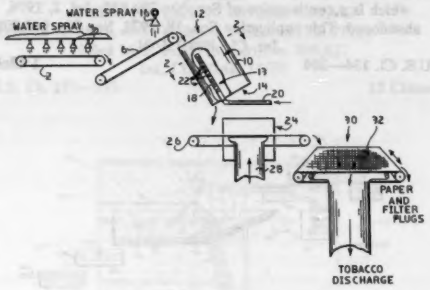
means of delivering steam within said bore;

means for rotating said cylinder about its lengthwise axis;

means for delivering cigarettes into the first open end;

means for saturating the paper wrappers of said cigarettes with hot water adjacent said first open end;

said cylinder being positioned at an angle inclined to the horizontal so that cigarettes delivered at the first open end will be carried by gravity out of the second open end;



dryer means positioned to receive cigarettes discharged from the second open end of the cylinder; and

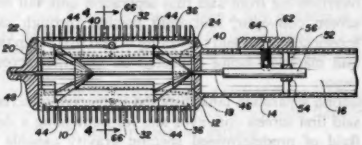
classifying means associated with the dryer means for separating the dried tobacco from the remaining components of the cigarettes.

4,191,200

HAIR DRESSING COMB

Frank J. Renda, 752 Colonial Ave., York, Pa. 17403

Filed Mar. 9, 1978, Ser. No. 884,920
Int. Cl.[2] A45D *24/10*
U.S. Cl. 132—123 **8 Claims**



1. A hair dressing comb comprising in combination, a substantially cylindrical housing, a handle extending axially from one end thereof, a plurality of elongated combs mounted within said housing and extending longitudinally therein, means within said housing supporting said combs radially relative to the axis of said housing in circumferentially spaced positions relative to each other, said housing having openings therein through which at least the teeth of said combs can project radially outward from a retracted position substantially within said housing to extended operative positions therebeyond, cam means within said housing engageable simultaneously with said combs and movable in one direction to project at least the teeth of said combs simultaneously from said housing through said openings therein to the extended operative positions thereof, and spring means respectively mounted upon said combs and tensioned to normally hold said combs retracted within said housing and said cam means frictionally and slidably engaging said combs for axial movement in one direction to move said combs to extended operative position beyond said housing and thereby tension said springs to an even greater extent and said cams being slidably movable in an opposite direction to instantly release said tension of said springs to cause them to retract said combs to inoperative position within said housing.

4,191,201

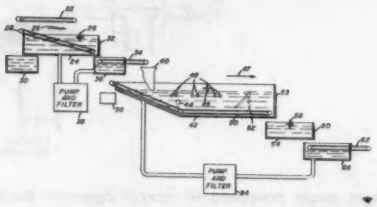
APPARATUS FOR SELECTIVELY RECLAIMING PARTS FROM FILM CARTRIDGES

Clive D. Barnsbee, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 844,950, Oct. 25, 1977, abandoned, which is a continuation of Ser. No. 701,925, Jul. 2, 1976, abandoned. This application Sep. 18, 1978, Ser. No. 943,508

Int. Cl.² B08B *3/04*

U.S. Cl. 134—104 **1 Claim**



1. Apparatus for use in separating materials having different specific gravities wherein at least some of said materials are of a geometry that causes them to tend to float in a fluid having a lower specific gravity, and wherein at least some of said materials are affixed together by an adhesive, said apparatus comprising:

a first separation tank for containing a fluid of predetermined specific gravity, said first tank having disposed therein a rotary paddle wheel for providing mild agitation to said fluid;

a first sump tank including a first screen conveyor, said first sump tank disposed so that fluid and floating materials overflowing from said first separation tank fall onto said screen conveyor, said fluid passing through said first screen conveyor and collecting in said first sump tank, and said materials being collected on said first screen conveyor;

a second separation tank disposed to receive materials from said first screen conveyor and for containing a detergent fluid of predetermined specific gravity capable of dissolving said adhesive, said second tank including a ramp member disposed within said second tank so as to be submerged beneath said detergent fluid, and said second tank further including means for causing said detergent fluid to boil in a localized region within said tank to produce a turbulent region of fluid in said tank separated by said ramp member from a relatively calm region of fluid, whereby said turbulence facilitates sinking of those materials having a higher specific gravity than said detergent fluid but which are of a geometry that causes them to tend to float, said detergent fluid dissolves said adhesive permitting affixed materials to be separated, and said calm region of fluid further facilitates separation of said materials on the basis of specific gravity;

a third separation tank disposed to catch the overflow of detergent fluid and floating materials from said second separation tank, said third tank having a rotary paddle wheel disposed therein to provide mild fluid agitation; and

a second sump tank including a screen conveyor, said second sump tank disposed so that detergent fluid and floating materials overflowing from said third separation tank fall onto said screen conveyor, said detergent fluid passing through said screen conveyor and collecting in said second sump tank, and said remaining materials being collected on said second screen conveyor.

4,191,202

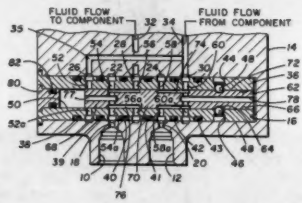
POLARITY CONTROL VALVE

Robert G. Brent, Arlington, Tex., assignor to Textron, Inc., Ft. Worth, Tex.

Continuation of Ser. No. 735,268, Oct. 26, 1976, abandoned. This application Jun. 14, 1978, Ser. No. 915,505

Int. Cl.² H01M *6/30*

U.S. Cl. 137—112 **4 Claims**



1. In a hydraulic actuator system including fluid pressure controlled elements, the improvement of a polarity control valve for establishing a hydraulic flow path from a pressure line connected to either of two input passages to the same one of two flow channels, comprising:

a housing having a chamber therein;

first and second input passages opening into the chamber of said housing;

first and second flow channels between the chamber and a fluid pressure controlled element; and

a valve spool slidably mounted for positive movement between first and second positions in said chamber and having radially extending lands to form separate annular chambers, said valve spool including:

a first annular chamber for connecting the first flow channel to the first input passage when the pressure line is connected to the first input passage and for connecting the second flow channel to the first input passage when the pressure line is connected to the second input passage;

a second annular chamber for connecting the first flow channel to the second input passage when the pressure line is connected to the second input passage and for connecting the second flow channel to the second input passage when the pressure line is connected to the first input passage;

said first and second annular chambers being out of fluid communication with each other in all postions of the valve spool;

flow passages in said spool to direct fluid pressure from the first and second input passages to opposite ends of said spool to positively move said valve spool between said positions and thereby establish the above described connections through said first and second annular chambers; and

means disposed within said housing for releasably holding said valve spool in said positions, said means being responsive to a preestablished pressure differential between the input passages.

4,191,203

FLUID CIRCUIT OR LOGIC ELEMENT

Pier L. Panigati, Lugano, Switzerland, assignor to Etablissement d'Occident, Vaduz, Liechtenstein

Filed Jun. 22, 1978, Ser. No. 917,883

Claims priority, application Switzerland, Jun. 27, 1977, 7860/77

Int. Cl.² G05D *11/00*

U.S. Cl. 137—112 **2 Claims**

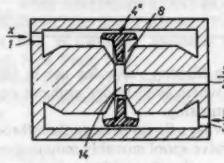
1. A logic element for representing the OR function, the element being of the type having two inlets for feeding in a fluid, an outlet, and a sealing device which is displaceable

under the action of the fluid in order to selectively bring about a connection between one or the other inlet and the outlet, wherein the improvement comprises:

a generally cylindrical housing having two spaced-apart inlets; a segment surrounded by and extending longitudinally in said housing and forming, with said housing, an annular chamber having a central axis,

said segment including means defining an annular slot in a surface thereof, the slot having walls sloping together toward said central axis of the annular chamber, the slot and segment providing a connection between input portions of the annular chamber to either side of the slot;

an outlet disposed in the housing and including a passageway



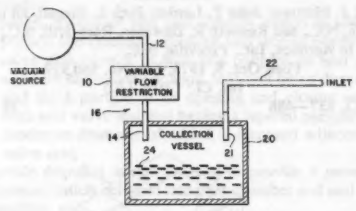
extending through said segment to a base portion of the slot; and

a sealing device with an annular configuration disposed at least partly in the slot, the sealing device having sides which diverge from the sides of the slot and having a predetermined clearance relative to the slot, the slot being at least equal in its longitudinal dimension to the longitudinal dimension of the sealing device, so that the resulting clearance permits an initial displacement of the sealing device along the central longitudinal axis of the annular chamber with subsequent rotation about its own torsional axis until it engages with the whole surface of its corresponding side of the slot and thus sealingly interrupts the connection between one of said two inlets and the outlet.

4,191,204
PRESSURE RESPONSIVE FLUID COLLECTION SYSTEM

John R. Nehring, Bergen, N.J., assignor to International Paper Company, New York, N.Y.

Filed Apr. 14, 1975, Ser. No. 567,552
Int. Cl.² A61M *1/00*
U.S. Cl. 137—205 **13 Claims**



1. A system for collecting body fluids comprising:

(a) a vacuum source;

(b) a closed fluid collection vessel having an inlet port and an outlet port, said ports being in flow communication above the level of fluid within said vessel;

(c) an inlet conduit having its discharge end in flow communication with said inlet port and its intake end disposed to be immersed in said body fluid;

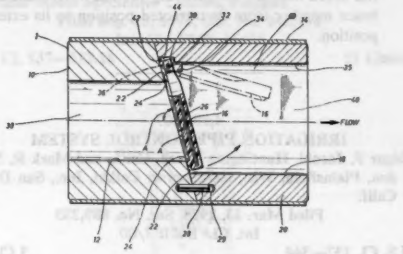
(d) a vacuum conduit connecting said vacuum source and said outlet port; and

(e) pressure responsive means associated with said vacuum conduit for reducing air flow to said vacuum source in response to a significant increase in pressure within said collection vessel caused by said inlet conduit ingesting significant amounts of air.

4,191,205
THERMOPLASTIC CHECK VALVE

Franklin A. Nash, 4817 Welford, Bellaire, Tex. 77401

Filed Mar. 21, 1978, Ser. No. 888,627
Int. Cl.² F16K *15/03*
U.S. Cl. 137—375 **13 Claims**



9. A check valve comprising:

a cylindrical sleeve;

a first and second cylindrical thermoplastic element contained in said sleeve, said elements having throughholes whose centerline axes are in alignment, said second element throughhole diameter greater than said first element throughhole diameter;

a central passageway formed by said throughholes;

a first annular sealing surface formed on said first element around said central passageway in a plane inclined to the center-line axis of said passageway;

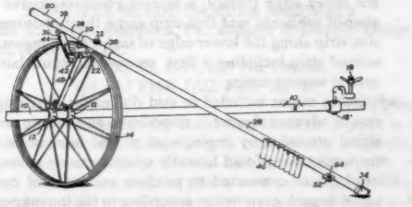
a disk-shaped rotatable flapper mounted to said second element, said flapper rotatable from a first position in which said flapper is out of said central passageway to a second position in which said flapper is contacting said first sealing surface; and

a second sealing surface connected to said flapper for sealing against said first sealing surface when said flapper is in contact with said first sealing surface.

4,191,206
AUTOMATIC WIND BRACE FOR SIDE ROLL IRRIGATION SYSTEM

Larry W. Baker, Rte. 1, Box 52 C, Burley, Id. 83318

Filed Oct. 2, 1978, Ser. No. 947,486
Int. Cl.² B05B *3/18*
U.S. Cl. 137—344 **12 Claims**



1. A wind brace for a side roll irrigation system wherein lengths of interconnected irrigation pipes are supported through the hubs of a plurality of spaced-apart wheels, the wind brace comprising:

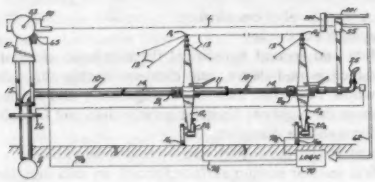
(a) a base member,
(b) attaching means for mounting the base member on a side roll irrigation system radially outward of the irrigation pipe thereof,
(c) an elongated brace member having inner and outer ends,
(d) pivot means on the base member mounting the brace member adjacent the inner end thereof for pivotal movement of the brace member between a retracted, inoperative position substantially parallel to the irrigation pipe and an extended, operative position projecting angularly downward to the ground, and
(e) damper means interconnecting to the base member and the brace member for delaying pivotal movement of the brace member from its retracted position to its extended position.

4,191,207

IRRIGATION PIPE CONTROL SYSTEM

Edgar F. Jacobi, Huntington Beach, Calif., and Mark R. Madden, Plainsfield, Wis., assignors to Colkhi, Inc., San Diego, Calif.

Filed Mar. 23, 1978, Ser. No. 889,233
Int. Cl.[2] B05B *3/00*
U.S. Cl. 137—344 **3 Claims**



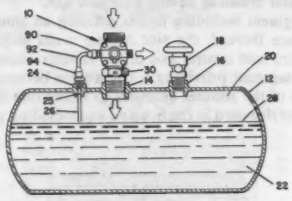
1. A control system for correcting deflections of a movable irrigation pipe including powered dollies for support, said irrigation pipe including a pivoted end and a free end comprising:
a source of electrical excitation;
a laser operatively connected to said source for producing a laser beam;
mounting means deployed on said pivoted end of said pipe and connected to support said laser thereon, said mounting means including a pivotal gear means aligned to provide pivotal motion of said laser in a vertical plane including the central axis of said pipe and a servo motor connected to pivot said gear means in response to vertical control signals;
sensing means deployed on said free end of said pipe and aligned for exposure to said laser beam, said sensing means including a first horizontal photoresponsive strip along the upper edge thereof, a second photoresponsive strip aligned subjacent said first strip and a third photoresponsive strip along the lower edge of said sensing means, said second strip including a first, second and third laterally spaced sensing zones;
advancing means included in said dollies for changing the rate of advance thereof in response to an advance control signal produced by impingment of said laser beam on a respective one of said laterally spaced sensing zones; and
control means connected to produce said vertical control signal to said servo motor according to the impingment of said laser beam on said first and third strip and to produce a control signal indicative of the impingment of said laser beam on said first and third zones to maintain said laser beam on said second strip regardless of the relative vertical movement of said free end of said irrigation pipe.

4,191,208

AUTOMATIC FILL-STOP VALVE

Gerald D. Mylander, 1232 W. Collins, Orange, Calif. 92667

Filed Sep. 14, 1977, Ser. No. 833,020
Int. Cl.[2] F16K *21/18*
U.S. Cl. 137—393 **6 Claims**



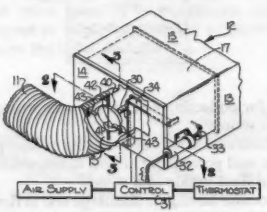
1. An automatic fill-stop valve for use in filling tanks for containing liquid which boils under ambient conditions, said fill-stop valve comprising:
a valve body having a liquid passage therethrough, a bore in said body, a valve spool movably mounted in said bore for moving from a closed position wherein said liquid fill passage is closed to an open position wherein liquid filling can take place, said valve spool having a large piston thereon, said valve body having a drive chamber therein, said large piston being open to said drive chamber so that pressure in said drive chamber moves said spool toward the valve closed position a ram disc bore, in said drive chamber, said ram disc bore being of larger diameter than said large piston, a ram disc in said ram disc bore, said ram disc being movable in said ram disc bore in a direction to urge said valve spool in a valve closing direction, said valve spool lying against said ram disc when said valve spool is in its valve open position;
a level-sensing system comprising a level-sensing tube and a first orifice in series with said tube, the side of said ram disc away from said valve spool being open to said level-sensing system so that increases in pressure in said level-sensing system urge said ram disc and said valve spool toward the valve closed position, said level-sensing system further including a second orifice and a manually operable valve, said drive chamber being connected to said level-sensing system between said first and second orifices.

4,191,209

AIR FLOW SENSING DEVICE FOR AIR CONDITIONING SYSTEMS

Frank J. Mattson; John T. Lawler; Jack L. Stegall, all of Charlotte, N.C., and Kenneth R. Dawkins, Rock Hill, S.C., assignors to Aeronca, Inc., Pineville, N.C.

Filed Oct. 5, 1978, Ser. No. 948,919
Int. Cl.[2] G01F *1/05*
U.S. Cl. 137—486 **18 Claims**



12. In an air flow system having an air flow sensor mounted in the air flow path and wherein an inaccurate reading of the air flow may be obtained by the sensor because of an uneven

air velocity distribution at the sensor, as may occur when there is a curved air flow path adjacent to and preceding the sensor, the combination therewith of means for obtaining a more accurate sensor reading when an uneven air velocity distribution occurs at the sensor, and means comprising air redirecting means positioned in the air flow closely adjacent and preceding said sensor and being mounted for movement in response to impingement thereon of an air flow having an uneven velocity distribution to redirect the air flow and provide a more representative air velocity condition at the sensor.

4,191,210

APPARATUS FOR BRAKING SYSTEMS INCORPORATING A PRESSURE-CONTROL DEVICE FOR ANTISKID CONTROL

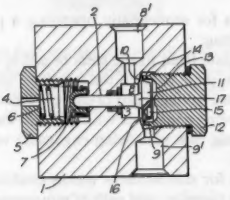
Juan Belart, Walldorf, and Dieter Kircher, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to ITT Industries, Incorporated, New York, N.Y.

Filed Dec. 8, 1977, Ser. No. 858,510

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1977, 2702399

Int. Cl.² F16K *31/12*

U.S. Cl. 137—505.13 **4 Claims**



1. Apparatus for braking systems incorporating an antiskid pressure control device comprising:

a housing having a longitudinal axis;

a stepped bore disposed coaxial of said axis including

a first portion having a first given diameter,

a second portion integral with said first portion having a second given diameter greater than said first given diameter, said second portion providing an outlet chamber, and

a third portion integral with said second portion having a third given diameter greater than said second given diameter, said third portion providing an inlet chamber;

a valve seat formed in said bore at the junction of said second and third portions;

a valve member movable in response to braking pressure including

a piston coaxial of said axis slidably sealed in said first portion and extending through said second portion, and

a valve disk coaxial of said axis coupled to said piston adjacent said second portion, said disk being disposed in said third portion in an opening and closing relation with said valve seat and having a tapered periphery the maximum diameter of which is disposed adjacent said valve seat;

a throttle disposed in said housing to provide a permanent communication between said inlet chamber and said outlet chamber; and

a valve passageway extending from a first transverse surface of said disk adjacent said valve seat to a second transverse surface of said disk remote from said valve seat including

a gap between said tapered periphery of said disk and the inner surface of a hollow cylindrical cap disposed coaxial of said axis and extending over and embracing said tapered periphery of said disk when said disk is in its open position, the outer surface of said cap being spaced from the inner surface of said third portion, said cap extending from an end wall of said third portion remote from said valve seat, the cross-section of said gap increasing due to said tapered periphery of said disk when said disk moves from its open position to its closed position to provide a rapid closing movement for said valve member by pressure fluid flowing through said gap from said first transverse surface to said second transverse surface, said passageway being closed by said disk being seated on said valve seat upon attainment of a predetermined value of braking pressure acting on said disk in opposition to a spring acting on an end of said piston remote from said disk.

4,191,211

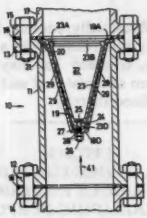
VALVE MEMBER FOR A NON-RETURN VALVE

Robert M. Walker, Barrow-on-Soar, England, assignor to The British Steam Specialties Limited, England

Filed Sep. 15, 1978, Ser. No. 942,491

Int. Cl.² F16K *15/14*

U.S. Cl. 137—512.15 **11 Claims**



1. A non-return valve, comprising:

a housing having inlet and outlet ends and attachment means for attaching the inlet and outlet ends of the housing, respectively, to inlet and discharge pipes;

a perforate, hollow, conoidally-shaped valve seat defining a cavity of circular cross-section mounted within the housing and having a base, a rim and mounting means at said rim for securing said valve seat in position in said housing; and

a valve member comprising a hollow conoidally-shaped diaphragm of elastomerically deformable material having a base, a rim, an inwardly directed bead around the rim and connecting means connecting the base of the diaphragm to the base of the valve seat so that the entire outer periphery of the rim of the diaphragm is in sealing engagement with the inner periphery of the rim of the valve seat, whereas at least part of the remainder of the outer surface of the diaphragm is spaced inwardly of the cavity defined by the valve seat;

the diaphragm having, throughout part of its axial length, a cross-section which, before insertion of the valve member into the valve seat, has a non-annular shape which is bounded by non-circular inner and outer peripheries.

4,191,212

MULTIPLE BLADE DAMPER ASSEMBLY

Donald K. Hagar, Allentown, Pa., assignor to Damper Design, Inc., Allentown, Pa.

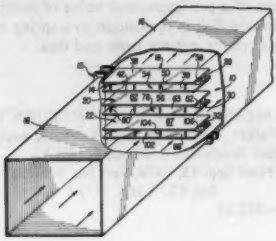
Filed May 18, 1977, Ser. No. 798,166

Int. Cl.² F16K *1/22*; F24F *13/16*

U.S. Cl. 137—601 **19 Claims**

1. A damper assembly for controlling the flow of gases in a conduit, the assembly comprising, in combination, a plurality of generally rectangular blades, each including a pair of spaced, generally rectangular plates, each pair of plates defining a substantially unrestricted open flow passageway extending entirely through each blade, each blade having a pivot axis extending longitudinally thereof, the pivot axes of said plurality of blades supporting said blades and allowing said blades to swing about their respective axes into a closed condition wherein a first series of said plates are aligned in one common

plane and wherein a second series of plates are aligned in a second common plane, said first and second series of plates forming an enclosed sealing space, said plurality of blades also being swingable into an open position wherein said plates of



each blade are all substantially parallel to the plates of the other blades in side-by-side relationship and aligned with the direction of gas flow, whereby gas may flow between said blades and also between said plates of said blades through said open passageways defined thereby.

4,191,213

CHANGE OVER DEVICE FOR CONTINUOUSLY CASTING VARIOUS EMULSIONS FOR PHOTOGRAPHIC PURPOSES

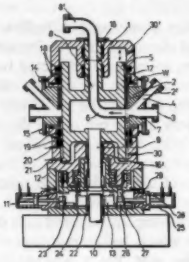
Ludvik Dölling, Holzkirchen; Wilhelm Haag, Hohenbrunn-Riemerling, and Herbert Heindze, Hohenschaeftlarn, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Oct. 21, 1977, Ser. No. 844,402

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1976, 2648574

Int. Cl.² F16K *11/02*

U.S. Cl. 137—625.17 **12 Claims**



1. A change-over device for continuously coating a plurality of emulsions onto a film support at a coating station for the production of photographic materials, comprising a cylinder for containing pressure and which has a plurality of radial apertures, a sealing plate closing each of the apertures, each of the sealing plates having mounted thereon a feed and return pipe manifold, clamping means securing the sealing plates to the cylinder at the apertures in pressure-tight relationship, a change-over piston in the cylinder which is capable of both rotational and axial movements, the piston having an inlet conduit having a radial portion with inlet means for communicating with a selected one of the manifolds and an axial portion with an outlet means for connection to the coating station, a piston rod connected to the piston and to a rotary drive member, a clutch for transmitting rotational force between the rotary drive member and the piston rod for rotating the piston, the clutch including a rotary indexing unit rotatably mounted in the cylinder and surrounding the piston rod whereby the inlet means is aligned and connected to a selected one of the feed and return pipe manifolds, axially sliding rotary drive means connecting the clutch to the piston rod, fluid pressure means connected to the cylinder on two ends of the piston whereby the inlet means in the piston is moved axially out of and into axial alignment with the manifolds for alternatively blocking flow and causing flow between the selected one of the manifolds and the inlet conduit in the piston whereby a selected one of the emulsions is supplied to the coating station.

4,191,214

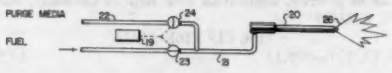
SEQUENTIAL OPERATING MECHANISM FOR VALVES

Thomas H. Holley, Richardson, and Robert J. George, Dallas, both of Tex., assignors to Forney Engineering Company, Carrollton, Tex.

Filed Jul. 7, 1978, Ser. No. 922,695

Int. Cl.² F16K *31/163*

U.S. Cl. 137—630.2 **11 Claims**



1. Apparatus for sequentially operating a pair of adjacent valves comprising:

a first cam plate fixed to the stem of a first valve;

a second cam plate fixed to the stem of a second valve;

actuator means having a pair of cam pins thereon, one of said cam pins being engagable with said first cam plate and the other of said cam pins being engagable with said second cam plate;

guide means for said actuator means establishing a path of movement therefor, said path of movement being rectilinear and extending past both of said cam plates; and

means for moving said actuator means back and forth along said path of movement;

said cam plates each being provided with camming surfaces thereon configured with respect to the path of movement of said actuator block, the position of said cam pins thereon, and the positions of said valve stems so that upon movement of said actuator means along said path of movement in one direction, one of said valves is completely actuated before actuation of the other of said valves begins, and both valves are fully actuated during the course of said movement.

4,191,215

DIGITAL FLUID FLOW RATE CONTROLLER

Winfried K. Gonner, Uberlingen, Fed. Rep. of Germany, assignor to Bodenseewerk Perkin-Elmer & Co., GmbH, Uberlingen, Fed. Rep. of Germany

Filed May 19, 1978, Ser. No. 907,467

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1977, 2725410

Int. Cl.² F16K *11/24*

U.S. Cl. 137—870 **8 Claims**

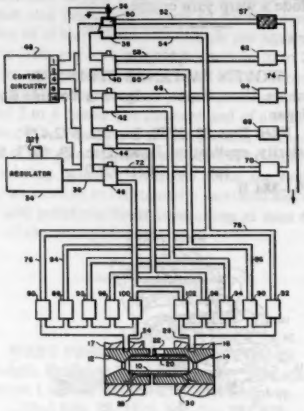
1. A flow rate control system for metering a predetermined fluid flow from an inlet manifold to a desired terminus, said system including:

at least one directional control valve coupled to the manifold, said valve being switchable between first and second positions for directing the fluid from said manifold between first and second outlet conduits;

a first fluid flow restrictor in said first outlet conduit, said first restrictor being calibrated to pass a predetermined flow of said fluid at a predetermined pressure to the desired terminus;

a second fluid flow restrictor in said second outlet conduit, said second restrictor having a fluid resistance substantially equal with that of said first restrictor, said second

restrictor coupled to a vent conduit for removing the fluid passing through said second conduit from the system; and electrical means for rapidly switching said control valve



between said first and second positions whereby a continual and constant flow of said fluid will pass through said valve and whereby said switching will not alter the pressure within said manifold.

4,191,216

FABRICATED ORIFICE FITTING MECHANISM FOR PIPELINES

Walter L. Connolly, Houston, Tex., assignor to Daniel Industries, Inc., Houston, Tex.

Filed Jul. 10, 1978, Ser. No. 923,023
Int. Cl.[2] F16D *1/00*
U.S. Cl. 138—44 **16 Claims**

1. An orifice fitting body structure of fabricated construction comprising:

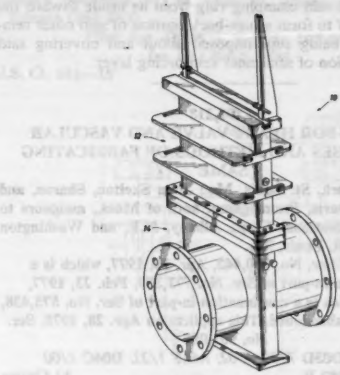
a pair of end plates being positioned in generally parallel relation, said end plates defining circular flow passage openings;

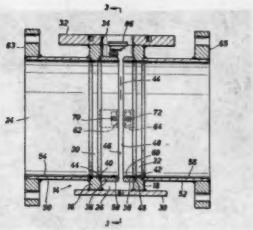
a pair of side plates being connected to said end plates by internal and external welds and cooperating with said end plates to define a generally rectangular body tube having registering flow passage openings;

a bottom plate being secured to first extremities of said end plates and side plates by internal and external welds;

a connection flange plate being secured to second extremities of said end plates and side plates and defining a body access openings, at least some of said internal welds being formed by extending welding means through said body access opening, said end, side, bottom and connection flange plates cooperating to define a pressure containing body structure;

a pair of hub rings being located within said pressure containing body in registry with said flow passage openings of said side plates and with end faces thereof positioned in closely spaced opposed relation, said hub rings being welded to said end plates about said flow passage openings; and





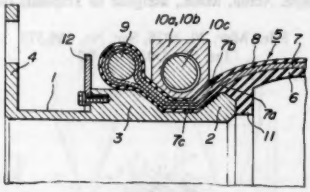
conduit means being connected to said end plates about said flow passage openings.

4,191,217

REINFORCING RUBBER HOSE

Mamoru Kadono; Tetsuji Saigusa; Yoshiyuki Nakajima, and Tomohiro Koga, all of Yokohama, Japan, assignors to Bridgestone Tire Company, Limited, Tokyo, Japan

Filed Dec. 6, 1978, Ser. No. 966,991
Claims priority, application Japan, Dec. 6, 1977, 52-146356
Int. Cl.[2] F16L *11/12*
U.S. Cl. 138—109 **3 Claims**



1. In an end structure for a reinforced rubber coupling hose comprising a pair of cylindrical mouth pieces each having an annular intermediate rib and an annular end rib, a hose body extending across these cylindrical mouth pieces and composed of inner and outer rubber layers, and a clamping ring arranged at each end of the hose body and wound around by the free end of the reinforcing layer, the clamping ring urging the reinforcing layer against the annular intermediate rib of the cylindrical mouth piece so as to make the hose body integral with the

cylindrical mouth piece, the improvement wherein at least one free end of said reinforcing layer is composed of inner and outer reinforcing layers, said inner reinforcing layer being wound around said clamping ring from its inside toward the outside thereof to form a turn-back portion of said outer reinforcing layer being superimposed about and covering said turn-back portion of said inner reinforcing layer.

4,191,218

FABRICS FOR HEART VALVE AND VASCULAR PROSTHESES AND METHODS OF FABRICATING SAME

Richard E. Clark, St. Louis, Mo.; John Skelton, Sharon, and Robert B. Davis, Framingham, both of Mass., assignors to Albany International Corp., Albany, N.Y. and Washington University, St. Louis, Mo.

Division of Ser. No. 790,442, Apr. 25, 1977, which is a continuation-in-part of Ser. No. 771,359, Feb. 23, 1977, abandoned, which is a continuation-in-part of Ser. No. 575,438, May 7, 1975, abandoned. This application Apr. 28, 1978, Ser. No. 901,085

Int. Cl.[2] D03D *7/00, 3/02;* A61F *1/22;* D04C *1/00*

U.S. Cl. 139—383 R **12 Claims**

1. A fabric for a cardiovascular prosthesis comprising woven multifilament polymeric yarns extending in first and second directions forming an angle therebetween, the yarns in each of said directions having crimps similarly oriented with respect to the plane of the fabric and being bloomed in their interstices to form a substantial number of open interstitial spaces in the range of 20 to 40 microns evenly distributed throughout the fabric, the stretch characteristic of the fabric having a region of easy elongation up to at least ten percent in at least one of said directions.

4,191,219

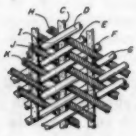
TRIAXIAL FABRIC PATTERN

Dianne Kaye, Acton, Mass., assignor to Tripoint, Inc., Acton, Mass.

Filed Mar. 20, 1978, Ser. No. 888,377

Int. Cl.[2] D03D *13/00*

U.S. Cl. 139—383 R **5 Claims**



1. A triaxial fabric comprising a first set of warp yarn courses and second and third sets of weft yarn courses, the yarn courses of each set being woven at an acute angle to and intersecting the yarn courses of each other set, wherein each intersection of a warp yarn course with a weft yarn course includes yarn courses of both said second and said third weft sets, but only alternate intersections along the length of each weft yarn course include a warp yarn course.

4,191,220

WOVEN FASTENER STRINGER

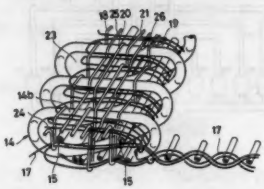
Hiroshi Yoshida, Uozu, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Dec. 22, 1978, Ser. No. 972,429

Claims priority, application Japan, Dec. 29, 1977, 52-5389

Int. Cl.[2] D03D *1/00*

U.S. Cl. 139—384 B **4 Claims**



1. A woven fastener stringer comprising a woven tape formed with foundation warp and weft threads and consisting of a web section defining a major dimension of said tape and a woven filament section defining a longitudinal edge portion of said tape; a row of successively interconnected elongated loops woven into said filament section, each of said loops having a coupling head at one end thereof, an upper leg and a lower leg extending from said head in a common direction, and a heel portion at the opposite end remote from said head connected to a next adjacent one of said successive loops; a plurality of reinforcing cords extending longitudinally through said row of elongated loops; and a combination of a first group of binding warp threads extending over said upper legs and alternately overlying and underlying said foundation weft thread in the spaces between each adjacent pair of said loops, a second group of binding warp threads extending over said upper legs in parallel relation to said first group of binding warp threads and alternately overlying and underlying said foundation weft thread in the spaces between every other adjacent pair of said loops, said first and second groups of binding warp threads being engaged with said foundation weft thread at positions underlying said reinforcing cords.

4,191,221

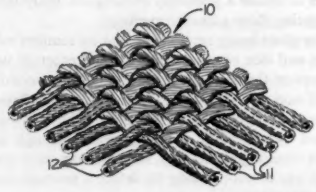
SHEETING FABRIC FORMED OF CORESPUN YARNS

Hugh J. Boyer, Eden, N.C., assignor to Fieldcrest Mills, Inc., Eden, N.C.

Filed Aug. 30, 1978, Ser. No. 938,031

Int. Cl.[2] D03D *15/00;* D02G *3/36*

U.S. Cl. 139—426 R **6 Claims**



1. A percale sheeting fabric of polyester and cellulosic fiber construction which more effectively utilizes the beneficial properties of the cellulosic fiber as compared to conventional polyester and cotton blend sheeting fabric constructions so as

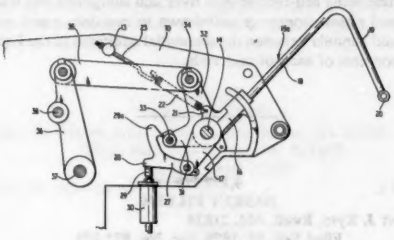
to provide a greatly increased moisture absorbency rate for enhanced comfort, and with enhanced cover, bulk, and opacity, said fabric being formed of warp and filling yarns of corespun construction having a yarn count of about 34/1 to 37/1 cotton count and being interwoven to form a woven fabric construction of at least about 180 threads per square inch and wherein the picks per inch are approximately 10 to 20 percent less than the warp ends per inch, each of the corespun warp and filling yarns having a core portion formed of multifilament polyester of 2 to 4 denier per filament and of a total denier of about 45 to 50, and having a sheath portion formed of cellulosic fibers of a staple length of at least 1 1/16 inch, the cellulosic fibers being helically wrapped about the multifilament polyester core portion to substantially surround and encase the same, and said cellulosic fibers comprising at least 65 percent by weight of the corespun yarn.

4,191,222

WEFT PRESENTER MECHANISMS

Brian Marshall, Keighley, England, assignor to Macart Textiles (Machinery) Limited, Bradford, United Kingdom

Filed Feb. 28, 1978, Ser. No. 881,938
Int. Cl.² D03D *47/38*
U.S. Cl. 139—453 **9 Claims**



1. A weft presenting mechanism for use on a loom, the mechanism comprising:

(a) a plurality of fingers each having an eyelet to receive a weft thread and being pivotally mounted about a common axis for movement between an inoperative position and an operative position;

(b) drive means pivotally mounted for movement about said common axis, said drive means comprising a pair of bellcrank levers, one mounted at each side of the plurality of fingers, so that the fingers are sandwiched therebetween, a first bar extending between one arm of each lever and a second bar extending between the other arm of each lever;

(c) means connected to said second bar to impart rotary reciprocating motion to said bellcrank levers causing said first bar to repeatedly rock about said common axis, moving first in a driving direction and then back in a return direction;

(d) a plurality of catches, one attached to each of the said fingers, each catch comprising a hook; and

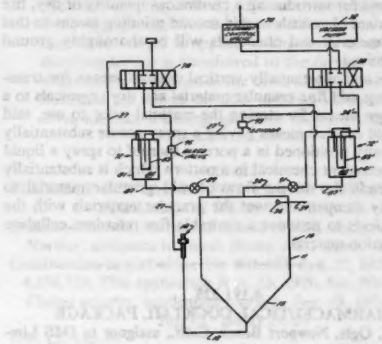
(e) control means selectively operable to move any desired hook into the path of the said first bar so that as the said first bar moves past the hook in its driving direction it catches on the hook and moves the hook and attached fingers with it, the rocking movement of the said first bar thus being imparted to the associated finger thereby causing the finger to move from its inoperative position to its operative position as the first bar moves in its driving direction and then back again to its inoperative position as the first bar moves in its return direction.

4,191,223

POWDER TRANSFER SYSTEM

Leonard Bourgeois, 341 St. Marc St., Chateauguay, Quebec, Canada (J6J 2K2)

Filed Apr. 18, 1978, Ser. No. 897,485
Int. Cl.² B65B *1/04*
U.S. Cl. 141—18 **13 Claims**



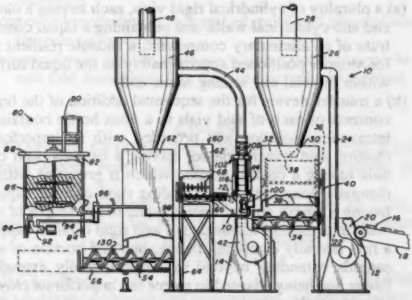
12. A power transfer apparatus comprising a reservoir, an outlet conduit having one end thereof in fluid communication with a lower portion of said reservoir, a vacuum source, a filling assembly including a filling nozzle connected to the other end of said outlet conduit, conduit means extending between said vacuum source and said filling assembly and operative to cause a powder to flow through said outlet conduit when a vacuum is applied, refill means for refilling said reservoir from an external container, said refill means including an inlet situated in an upper portion of said reservoir, and filter means in said conduit means between said vacuum source and said filling assembly, said filter means including a discharge conduit extending from the filter to said reservoir such that any powder retained by said filter means may be selectively recycled back to said reservoir.

4,191,224

APPARATUS FOR MAKING CELLULOSE INSULATION

Kenneth L. Bontrager, Jefferson County, Colo.; Marion R. Bontrager, Phoenix, Ariz.; Robert J. Taylor, and David C. Card, both of Denver, Colo., assignors to Diamond Insulation Industries, Inc., Denver, Colo.

Filed Aug. 5, 1977, Ser. No. 822,232
Int. Cl.² B05C *5/00, 11/10*
U.S. Cl. 141—100 **7 Claims**



1. An apparatus for making cellulose fire retardant insulation which comprises:

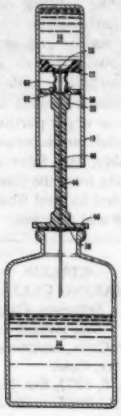
(a) first grinding means for grinding waste paper and other cellulose material into a coarse granular state;
(b) a second grinding means for grinding the coarse ground material into a fine granular state;
(c) first conduit means for transporting the coarsely ground material from said first grinding means to said second grinding means;
(d) means for introducing a continuous quantity of dry, fire retardant chemicals to said second grinding means so that said meterial and chemicals will be thoroughly ground and mixed;
(e) a second substantially vertical conduit means for transporting said fine granular material and dry chemicals to a storage means for storing the material prior to use, said second conduit means having a spray nozzle substantially centrally positioned in a portion thereof to spray a liquid fire retardant chemical in a pattern which is substantially perpendicular to the flow of said granular material to evenly dampen and wet the granular materials with the chemicals to produce a desirable fire retardant cellulose insulation material.

4,191,225

PHARMACEUTICAL COCKTAIL PACKAGE

Robert W. Ogle, Newport Beach, Calif., assignor to IMS Limited, South El Monte, Calif.

Continuation of Ser. No. 734,254, Oct. 20, 1976, abandoned.
This application Jan. 3, 1978, Ser. No. 866,380
Int. Cl.[2] B65B *3/04*; A61M *5/00*
U.S. Cl. 141—329 **1 Claim**



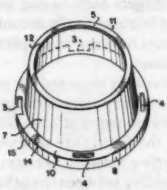
1. An alimentation kit comprising:
(a) a plurality of cylindrical rigid vials, each having a closed end and cylindrical walls, and containing a liquid concentrate of an alimentary component, a slidable resilient piston stopper positioned approximately on the liquid surface within the vial and sealing same; and
(b) a transfer device for the sequential addition of the liquid contents of each of said vials to a glass bottle containing intravenous solution and provided with an imperforate closure, said transfer device having a cannula, said cannula having a central portion which is provided with an elongated longitudinally extending rigid cannula support having a length approximately equal to the length of said vials, in proximity to one end of said rigid cannula support a first laterally extending flange, one end portion of said cannula extending beyond said first laterally extending flange and being adapted to pierce the imperforate closure of said bottle containing intravenous solution, said first laterally extending flange being adapted to act as a stop to limit the extent of advancement of said cannula and to abut said imperforate closure of said bottle containing intravenous solution, in proximity to the other end portion of said rigid cannula support a second laterally extending flange which is circular in shape and slightly smaller in diameter than the interior of said cylindrical walls of said rigid vials, the other end portion of said cannula extending beyond said second laterally extending flange and terminating in a sharpened outer end, a thin resilient tube over said sharpened outer end, said resilient tube being closed in proximity to the sharpened outer end and along the length of said other end portion of said cannula and having an open end provided with an external integral ring which is received in a complementary annular female groove in the walls of an axial cylindrical recess in said other end of said rigid support to form a seal therewith, said second laterally extending flange being slidably engageable with the interior of said cylindrical walls and said resilient tube being longitudinally compressible over and pierced by said sharpened outer end when one of said vials is fitted over said second laterally extending flange and the piston stopper of said one of said vials is forced over said sharpened outer end, said resilient tube being constructed and arranged to act in its compressed state as a stop for said piston stopper while said vial is advanced over said other end portion of said cannula and said other end of said rigid support, whereby said piston stopper can be slidably moved to the closed end of said vial and all of the contents of the vial can be transferred to the bottle of intravenous solution through said cannula, said resilient tube being self-recoverable over said sharpened end when said piston stopper is withdrawn to maintain a seal over said cannula between the sequential additions of the liquid contents of each of said vials.

4,191,226

BASKET FILLER

Garrett J. Kyte, Ewell, Md. 21824

Filed Feb. 15, 1978, Ser. No. 872,229
Int. Cl.[2] B65B *1/04*
U.S. Cl. 141—391 **2 Claims**

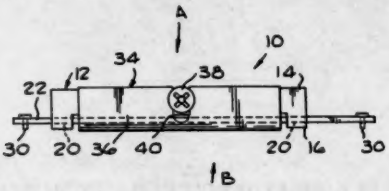


1. A basket filler for use in filling with marine life a basket having a pair of handles extending therefrom comprising:
a body which is frusto-conical in shape having open ends, one of which is larger than the other;
the larger end having an outwardly extending flange portion transverse to the central axis of the filler with a circumferential skirt extending axially from the outer circumference of the flange portion; and
means provided on said extending flange portion so the filler can be used upon said basket, whereby a lid for the basket can be associated with one handle of said basket while marine life is being put into the basket through the filler, and permitting quick removal of the filler and immediate closing of the basket lid to prevent escape of said marine life.

4,191,227
ATTACHMENT FOR A POWER TOOL

Daniel J. J. Venter, Pretoria, South Africa, assignor to Knipping (Proprietary) Limited, Johannesburg, South Africa

Filed Apr. 28, 1978, Ser. No. 900,877
Claims priority, application South Africa, May 4, 1977, 77/2680
Int. Cl.² B25B 23/10
U.S. Cl. 145—46 14 Claims

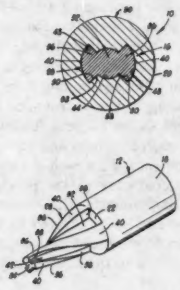


1. An attachment for an electric power tool, the attachment comprising a member having a formation for receiving a nose of a power tool, means for securing the attachment to the power tool, a movable element having an opening therein, the opening comprising a contiguous slot and an aperture, means for guiding said element between a position in which the aperture thereof is aligned with said formation of said member and a position in which said slot is aligned with said formation of said member, and a spacer for engaging a surface against which the attachment is placed, the position of said spacer with respect to said formation being adjustable.

4,191,228
TOOL ASSEMBLY

John W. Fenton, 1258 Aalapapa Dr., Kailua, Hi. 96734

Filed Jun. 7, 1978, Ser. No. 913,578
Int. Cl.² B25B 15/00
U.S. Cl. 145—50 A 5 Claims



1. In a tool assembly having a drive member and a driven member engagable with the drive member so that torque can be applied thereto, the improvement comprising:

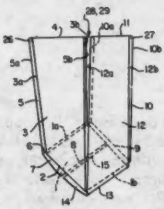
a male portion formed on one end of the drive or driven member, the male portion including a frusto-conic shaped hub which tapers away from the end of the member on which the male portion is formed to a flat which is perpendicular to the axis of the hub, and at least one spiralled lobe connected to and extending radially from the hub and spirally about the axis of the hub, the spiralled lobe comprising an outer arcuate face and a pair of angularly opposed side faces each coplanar with the axis of the hub, the spiralled lobe as a whole tapering in the same direction as the hub and converging therewith to a flat which is coplanar with the flat of the hub and

a female portion formed on one end of the other of the drive and driven member, the female portion formed as a frusto-conic shaped recess which tapers inwardly from the end of the other of the members and ends in a flat bottom and at least one spiralled slot extending radially from the recess and ending in a flat bottom coplanar with the bottom of the recess, the recess and the spiralled slot being sized and positioned to threadably engage the hub and the spiralled lobe, respectively, of the drive member to operatively engage the drive member and the driven member so that when torque is applied to the drive member in one direction torque is transferred to the driven member and when torque is applied to the drive member in an opposite direction the driven member remains stationary and the drive member is disengaged from the driven member.

4,191,229
FLEXIBLE CONTAINER FOR TRANSPORTATION AND STORAGE OF BULK MATERIALS

Johannes Skaadel, Skien, and Bjarne Omdal, Porsgrunn, both of Norway, assignors to Norsk Hydro A.S., Oslo, Norway

Continuation-in-part of Ser. No. 810,473, Jun. 27, 1977, Pat. No. 4,136,723. This application Nov. 13, 1978, Ser. No. 959,778
Claims priority, application Norway, Jun. 28, 1976, 762230
Int. Cl.² B65D 29/00
U.S. Cl. 150—1 8 Claims



1. A flexible container for transportation and storage of bulk material, said container comprising:

a single elongated piece of material having a major longitudinal dimension;

said piece of material being folded along plural fold lines extending transverse to said major longitudinal dimension, thereby forming plural wall sections and plural bottom sections, such that said plural bottom sections are overlapped to form a plural ply bottom of said container, and such that said wall sections are aligned with edges thereof juxtaposed;

at least portions of said juxtaposed edges of said wall sections being joined to form corner edges of said container;

certain of said fold lines forming an upper portion of said container;

opposite longitudinally free end edges of said piece of material being joined; and

edges of said bottom sections which extend transverse to said fold lines being free and substantially unattached.

4,191,230
INTEGRAL EXTRUDED CONSTRUCTION FOR BAGS

Steven Ausnit, New York, N.Y., assignor to Minigrip, Inc., Orangeburg, N.Y.

Continuation-in-part of Ser. No. 754,745, Dec. 27, 1976, abandoned, and Ser. No. 878,610, Feb. 16, 1978. This application Apr. 27, 1978, Ser. No. 900,567
Int. Cl.² B65D 33/24
U.S. Cl. 150—3 12 Claims

1. A plastic extruded bag construction, all of the following named parts of which are in a unitary one-piece plastic extrusion including:

a thin-wall plastic closure web area;

pull flange portions of substantial length having their lower proximal ends joined respectively to opposite ends of said closure web area, with said pull flange portions arranged to extend upwardly at respectively opposite sides of a bag mouth at the top of the bag;

separable interlocking complementary fastener profiles adjacent to said proximal ends of said pull flange portions and arranged to be interlockingly separably coupled together and separated by manipulation of said pull flange portions;

said closure web area being collapsed and extending inwardly into the bag clear of the coupled fastener profiles; and a bag body having bag wall panels with the upper ends thereof joined with the rest of the extrusion adjacent to the profiles whereby the closure web area provides a closure across the bag mouth inwardly from the fastener profiles and which closure must be ruptured to gain access into the bag body.

4,191,231

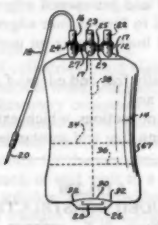
FLEXIBLE COLLAPSIBLE CONTAINERS, AND METHOD OF MOLDING

David A. Winchell, Twin Lakes; Jerry D. Martin, Kenosha, both of Wis., and Frank L. Roe, Hanover Park, Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jul. 22, 1977, Ser. No. 817,940

Int. Cl.[2] B65D *35/08*

U.S. Cl. 150—8 **5 Claims**



1. A blow-molded, flexible, collapsible container, free of laterally positioned longitudinal seal lines, which defines a sealed, collapsible portion of generally oval transverse cross-section and, defined at one end of said sealed portion, a shoulder portion having a wall thickness substantially thicker than the wall thickness of the sealed, collapsible portion, a plurality of spaced, upstanding sleeves being defined through said shoulder portion at said one end, the oval cross-sections of said sealed, collapsible portion defining major axes which are at least 50 percent greater than the minor axes of said oval cross-sections to facilitate flat collapse, and at the end of said container opposite to said shoulder portion end an integrally-attached, flat tail seal and hanger portion, said tail seal and hanger portion defining a continuous inner end integral with the remainder of said container material and having central and lateral portions, said continuous inner end being longitudinally recessed toward said container at its central portion relative to the lateral portions thereof to permit tucking of the hanger portion into the bag.

4,191,232

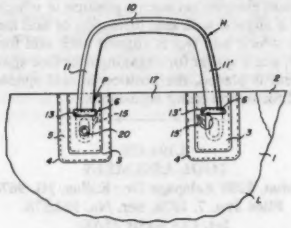
DUPLEX HANDLES OF MOLDED PLASTIC MATERIAL

Bela G. Szabo, Carnegie, Pa., assignor to Bruce Plastics, Inc., Pittsburgh, Pa.

Filed Jan. 19, 1979, Ser. No. 4,927

Int. Cl.[2] B65D *33/06*

U.S. Cl. 150—12 **1 Claim**



1. A limp receptacle comprising a pair of flexible sides, each having a pair of spaced pockets adjacent the upper edge thereof for receiving a U-shaped flexible handle of molded plastic material, said handle comprising a hand-hold at its midportion and a pair of legs extending from the opposite ends thereof and terminating in free extremities for connection to each side at said pockets, an integral flexible barb molded to each leg adjacent to each extremity and extending transversely therefrom for entrapment within each pocket to restrain withdrawal therefrom preparatory to the permanent connection therebetween, an enlargement at the lower end of each leg above said extremity and barb, adapted to limit the entry of said legs into the respective spaced pockets, and a rivet fastening each handle extremity to the side of the receptacle at said pockets.

4,191,233

SKI COVERS

Gordon McKay, 2326 Albert Ave., Saskatoon, Saskatchewan, Canada

Filed Nov. 9, 1978, Ser. No. 959,234

Int. Cl.[2] B65D *81/00*; A63C *11/00*

U.S. Cl. 150—52 R **16 Claims**

1. A pair of individual flexible and detachable cover assemblies, one each for each ski of a pair of skis, a web portion

extending from each of said cover assemblies intermediate the ends thereof and fastening means for detachably securing said

web portions together and hence said ski cover assemblies together.

4,191,234

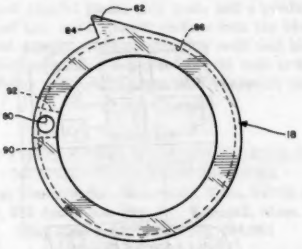
COVER FOR ROTATABLE SAMPLE TRAY

Laurence A. Rubin, Columbia, and William S. Baker, Annapolis, both of Md., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Aug. 21, 1978, Ser. No. 935,544

Int. Cl.[2] B67C *3/26*

U.S. Cl. 150—52 R **14 Claims**



1. An evaporation reducing cover for a rotatable sample tray which has sample receiving receptacles therein and which is positioned on a supporting means, said cover being adapted to be loosely positioned over the sample tray without securement to the tray or the supporting means and with the underside thereof resting on and covering the open tops of the receptacles, having means for holding the cover in a stationary position when the sample tray is rotated including means for frictionally engaging the rotatable sample tray when it is rotated so that concentric alignment of said cover and the sample tray is maintained during rotation of the sample tray and having passage means therethrough for allowing liquid sample to be inserted into or withdrawn from a receptacle when such receptacle is in registry with said passage means.

4,191,235

HOLDING DEVICES

Maurice Davis, Croydon, England, assignor to Davis Industrial (Filters) Limited, Croydon, England

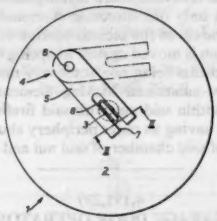
Filed Oct. 26, 1977, Ser. No. 845,782

Claims priority, application United Kingdom, Jan. 28, 1977, 3676/77

Int. Cl.[2] F16B *39/02*

U.S. Cl. 151—55 **2 Claims**

1. A holding device for holding against rotation a rotatable fastener of the type having head means engageable by manually operable means for exerting a positive non-frictional rotary force on the fastener to move it in fastening and unfastening directions, said device comprising a resilient body, means on said body for mechanically and directly engaging the head means of a fastener in a manner which prevents rotation of the fastener relative to said body, releasable mounting means on said body for pivotally mounting said body adjacent said fastener, said mounting means comprising a projection for making



snap engagement with or snap disengagement from an appropriately sized opening, and, when engaged in said opening, retaining said body in its mounted position regardless of the pivotal movement thereof, said body comprising a resilient strip resiliently moveable axially relative to a fastener until said head engaging means of said body is clear of said head means, and said body is then pivotal, while still mounted, to a position in which the fastener is free to rotate.

4,191,236

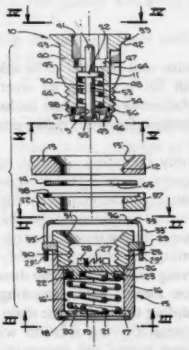
CAPTIVE PANEL FASTENER ASSEMBLY

John A. Duran, Glendora, Calif., assignor to Avibank Mfg., Inc., Burbank, Calif.

Filed Aug. 9, 1977, Ser. No. 823,397

Int. Cl.[2] F16B *43/00*

U.S. Cl. 151—69 **4 Claims**



1. A panel fastener assembly including; a stud nut having an enlarged head with a recess of irregular configuration adapted to receive a like configured tool therein, a threaded portion, a generally cylindrical portion interconnecting said enlarged head and said threaded portion, a cavity extending through said nut communicating with both said recess and the exterior of said nut, said cavity at the exterior of said nut forming a chamber having an inner wall, a spring-biased elongated pin mounted in said cavity and movable therein, said pin having a first portion extending into said recess and a second portion extending through an aperture in a locking element fixedly mounted in the chamber of said nut and inseparable therefrom, said locking element having a plurality of teeth extending away

from said pin with means on said teeth for permitting rotation of said teeth in only one direction; and

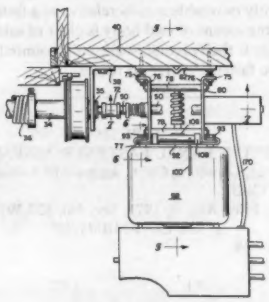
a sleeve having a generally cylindrical main body portion and a central chamber, a threaded portion communicating with said central chamber having threads thereon adapted to mate with the threaded portion of said nut, a spring-biased locking element movably mounted in said cavity and inseparable therefrom, said-mentioned locking element having a plurality of teeth configured similarly as the teeth on said first-mentioned locking element also adapted to rotate in only one direction surrounding a cavity for receiving the tip of the second portion of said pin therein when said pin is moved against its spring bias, both of said locking elements being non-rotatively mounted, the teeth on said first-mentioned locking element being entirely contained within said nut with said first-mentioned locking element having an outer periphery abutting against the inner wall of said chamber of said nut and trapped therein.

4,191,237

GARAGE DOOR OPERATOR

Clayton B. Voege, 1418 Alimingo Dr., Indianapolis, Ind. 46260

Filed Oct. 28, 1977, Ser. No. 846,414
Int. Cl.[2] E05F *15/16*
U.S. Cl. 160—188 **29 Claims**



1. A door operator unit adapted to be sold as such and to be mounted as a unit for actuating an overhead garage door which is counterbalanced by means including a drum shaft having a drum thereon for a lift cable attached to the door, comprising

a unitary assembly including a frame having a main shaft journalled therein, a worm gear mounted on said shaft and drivingly connected thereto, a motor mounted on said frame, and a worm mounted on the shaft of such motor in driving relation with the worm gear on the main shaft, and

means for mounting the unitary assembly with its main haft in coaxial driving relation with the drum shaft of the door counterbalance means, said mounting means including means for coupling the end of the main shaft of the operator unit is coaxial driving relation with the end of the drum shaft, and means for transmitting torque reactin from said frame to a fixed support.

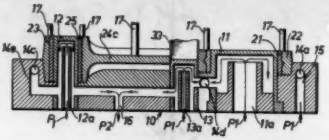
4,191,238

CONNECTING ROD OR THE LIKE AND METHOD AND MOULD FOR PRODUCING CONNECTING RODS OR THE LIKE

Heinz Pichl, Upsala, Sweden, assignor to AB Volvo Penta, Gothenburg, Sweden

Filed Apr. 15, 1977, Ser. No. 787,870
Claims priority, application Sweden, Apr. 28, 1976, 7604870
Int. Cl.[2] B22D *19/00*; G05G *1/00*
U.S. Cl. 164—100 **6 Claims**

1. The method of producing a piston rod or the like which comprises a non-ferrous body portion and a hard ferrous material continuous bearing race element embedded in said body portion and integral therewith, which method comprises placing said race element in a mould with a hollow cooling core fittingly disposed in said race element and with a mould cavity outwardly surrounding said race element, pouring hot molten



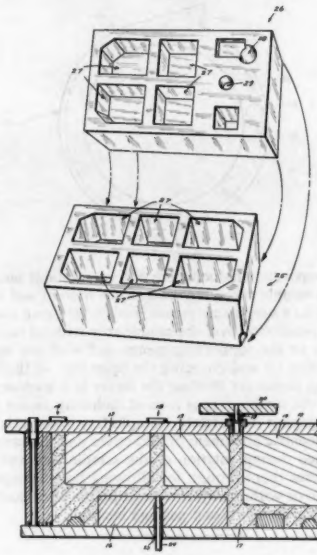
non-ferrous metal into said cavity while cooling said core by flushing the interior thereof with cooling liquid, permitting said non-ferrous metal to cool and solidify while continuing said flushing, and removing from said core and cavity said element and the resultant solidified non-ferrous metal ring formed therearound by said cavity.

4,191,239

BLOW PLATE STRUCTURE AND MOLD FORMED THEREBY

Ronald A. Cina, and Albert D. Kluge, both of Lansing, Mich., assignors to Roberts Corporation, Lansing, Mich.

Continuation-in-part of Ser. No. 763,813, Jan. 31, 1977, Pat. No. 4,074,744. This application Feb. 3, 1978, Ser. No. 874,869
Int. Cl.[2] B22C *15/24, 9/02*
U.S. Cl. 164—200 **3 Claims**



1. In a mold apparatus for forming block sand molds in connection with an automatic mold machine comprising:

a pattern plate adapted for supporting selected patterns on the upper surface thereof;

a four sided molding flask member mounted on the upper surface of said pattern plate, said molding flask having vertically extending side walls which intersect at right angles to form a four sided flask member; and

a blow plate selectively positioned across the top of said flask so as to define a block sand mold forming cavity in

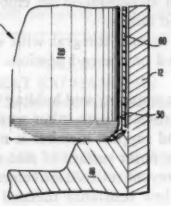
cooperation with said pattern plate and said molding flask member, said blow plate provided with one or more spaced-apart sand minimizer pocket forming finger extensions having vertical planar side walls which extend downwardly from the blow plate into said molding flask member, said spaced-apart sand minimizer pocket forming finger extensions being spaced from the side walls of said molding flask and cooperating with said flask to define honeycomb grid support wall forming cavities therebetween which cavities extend to the said blow plate and said flask member, said honeycomb grid wall forming cavities being in open communication with said block sand mold forming cavity, said blow plate provided with one or more blow hole openings therethrough through which sand is blown to fill said sand mold forming cavity and said honeycomb grid support wall forming cavities.

3. A block sand mold member of a block sand mold, said block sand mold member being shaped to define pairs of spaced apart opposed parallel planar side walls, an upper planar surface having a selected mold cavity formed therein and a lower planar surface having spaced apart sand minimizer pocket cavities formed therein; said upper and lower planar surfaces being spaced apart and parallel to each other with said pairs of spaced apart opposed parallel planar side walls being interposed therebetween and normal thereto thus defining said block sand mold member; said lower planar surface having said spaced apart sand minimizer pocket cavities formed therein so as to minimize the amount of sand required to form the block sand mold member; the spaced-apart sand minimizer pocket cavities being defined by support walls having planar side surfaces and a planar top surface which planar top surface forms a portion of said upper planar surface; said support walls being integral with said block sand mold member extending at least a portion of the distance between said pairs of spaced apart opposed parallel planar side walls and a predetermined distance from said lower planar surface into the block mold member; said support walls cooperating with said block sand mold member to define a honeycomb grid wall arrangement thereby defining said spaced apart sand minimizer cavities.

4,191,240
HEAT CONDUCTING FILLER MATERIAL FOR MOTOR-CONTAINING DEVICES

Clinton Rule, Thurston Rd., Gloucester, Mass. 01930, and Peter A. Rubel, 518 Annursnac Hill Rd., Concord, Mass. 01742

Filed Apr. 4, 1977, Ser. No. 784,081
Int. Cl.² F28F *13/00*
U.S. Cl. 165—1 **14 Claims**



1. A method of improving heat transfer conditions in apparatus of the type including a housing having an external surface and an internal surface defining a motor compartment and a motor mounted in said motor compartment, said motor and motor compartment having relative dimensions and shapes such that a gap exists between said motor and the internal surface of said housing, said method comprising the steps of:

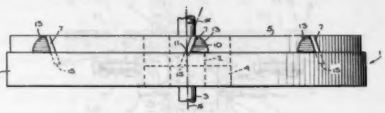
A. inserting in said gap between said motor and the internal surface of said housing at least one sheet of prestretchable thermoplastic material that exhibits a memory characteristic, said sheet being in a prestretched, reduced thickness state upon insertion in said gap so that only a portion of said gap is occupied thereby; and

B. expanding said sheet after its insertion in said gap toward its original unstressed state so that said sheet conforms substantially to the dimensions and shape of said gap and improves the transfer of heat generated by operation of said motor to said housing.

4,191,241
ENERGY EXCHANGE WHEEL AND METHOD OF FABRICATION

Timothy E. Brennan, Atlantic Highlands, N.J., assignor to Wing Industries, Inc., Cranford, N.J.

Filed Dec. 20, 1978, Ser. No. 971,191
Int. Cl.² F28D *19/00*
U.S. Cl. 165—10 **18 Claims**



1. An energy exchange wheel having a central axis and comprising:

an inner hub concentric with said axis;

an outer rim concentric with said axis and having its inner periphery spaced from the outer periphery of said hub;

an axially perforate matrix of energy absorbing material filling the space between said rim and said hub, said matrix having a plurality of slots therein extending radially from said hub to said rim;

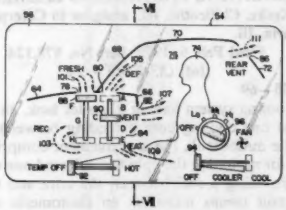
a plurality of bar-like spokes equal in number to the number of said slots disposed in said slots and extending at least from said hub to said rim, said spokes being secured to said rim at their radially outer ends and each spoke having a face in contact with a wall of the slot in which it is disposed, said face and said wall having a pitch angle with respect to said axis which will prevent movement of said matrix in a direction axially and away from said spokes; and

means maintaining the radially inner ends of said spokes in fixed relation to said hub.

4,191,242
AIR CONDITIONER OPERATING APPARATUS

Naotake Kumagai, Aichi, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Mar. 7, 1978, Ser. No. 884,164
Claims priority, application Japan, Mar. 28, 1977, 52/38149[U]; Jan. 24, 1978, 53/7108
Int. Cl.² B60H *1/00*; B60Q *11/00*; G08B *5/36*
U.S. Cl. 165—11 **32 Claims**



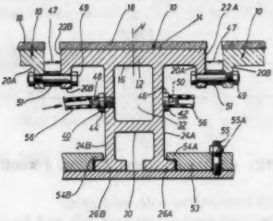
1. Air conditioner operating apparatus comprising an automotive air conditioner comprising component elements composed of a plurality of air intake ducts and a plurality of air

outlet ducts, an operating panel having a sketch corresponding to a cabin in which the air conditioner proper is provided, a plurality of means for indicating the flow of air into and out of the air conditioner proper provided in a plurality of positions on the sketch, control means movable between the plurality of indicating means, operating means actuated by the control means through connecting means to control the component elements, and said connecting means.

4,191,243
CHANNEL BEAM HAVING HEAT TRANSFER FLUID VOLUME DEFINED THEREIN

Byron A. Donzis, 24 Lana La., Houston, Tex. 77027

Filed Oct. 14, 1977, Ser. No. 842,089
Int. Cl.[2] F28D *21/00*
U.S. Cl. 165—45 **15 Claims**



12. A substantially planar athletic playing surface comprising:

a first and a second channel beam disposed in next-adjacency one with the other, each channel beam comprising:

a base portion having an upper and a lower surface thereon, the upper surface being substantially planar and having an athletic composition material disposed thereon;

first and second legs depending from the lower surface of the base portion;

a cross piece disposed between the legs and cooperating with the legs and the lower surface of the base portion to define a region adapted to carry a heat transfer fluid therein; and,

end caps securable to each axial end of each beam to enclose each region therein and define an interior volume within each channel beam;

means disposed below the lower surface of the base portion of each channel beam for inletting and outletting a heat transfer fluid from the interior volumes thereof; and,

means connecting the outlet of the first beam to the inlet of the second beam to define a continuous conduction path for the heat transfer fluid beneath the planar surface area.

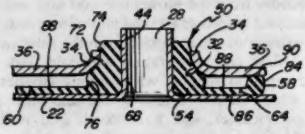
4,191,244
MODULAR HEAT EXCHANGER WITH RESILIENT MOUNTING AND SEALING ELEMENT

Frank E. Keske, Chilicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 9, 1978, Ser. No. 878,124
Int. Cl.[2] F28F *9/26*
U.S. Cl. 165—69 **6 Claims**

1. In a cooling system having a header tank, an outlet tank, and at least one cooling core extending between the header tank and the outlet tank, the improvement comprising:

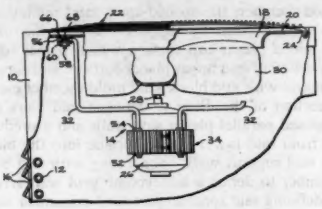
a means for mounting the core to a selected one of said tanks and providing a seal between the core and the selected tank, said means including an elastomeric element between the core and the selected tank integrally including a strip portion having a bore therethrough and being of a construction sufficient for receiving a selected portion of the cooling core therein, and a raised lip portion around the edge of the strip portion and the edge of the bore, said raised lip portion being deformed when compressed between the core and the selected tank to seal the connection between the selected portion of the core and the selected tank and to provide a damped resilient mount therebetween.



4,191,245
HEAT DISSIPATING MOTOR MOUNTING ARRANGEMENT

Michael E. Wendt, Tyler, Tex., and Danny D. Beaver, Ft. Smith, Ark., assignors to General Electric Company, Louisville, Ky.

Division of Ser. No. 695,940, Jun. 14, 1976, Pat. No. 4,103,192.
This application Feb. 24, 1978, Ser. No. 881,106
Int. Cl.[2] F20F *7/00*
U.S. Cl. 165—69 **1 Claim**



1. A refrigeration condenser unit comprising:

a housing having inlet openings arranged in at least one side of said housing and an outlet arranged in a top wall in said housing and a condenser in said housing arranged in air flow relationship with said openings and said outlet, a fan motor arranged for passing air through said openings between said housing and the ambient surroundings;

a split ring motor support member on said motor having an inner portion dimensioned to embrace the outer wall surface of said motor;

holding means formed integral with said support member being arranged on the end portions of said ring adjacent said split;

clamping means engaging said holding means for urging said end portions toward each other so that the inner contact portion of said support member is maintained in engagement with the outer surface of said motor with sufficient pressure to prevent relative movement therebetween, and to provide a low resistance thermal conductive path between the motor and the motor support member;

a plurality of parallel circumferentially spaced heat dissipating means being formed integral with said motor support member projecting radially outwardly and extending substantially the full axial dimension of said support member;

support arms including a first end having a non-circular cross section secured to the motor support member at spaced intervals around the circumference thereof and having their other end attached to the wall portion adjacent housing opening so as to center the rotational axis of said motor relative to said opening;

arm support elements formed integral with said motor sup-

port member and arranged substantially parallel to said heat dissipating means;

a non-circular passageway extending through said support elements for receiving said first end of said support arm in mating relationship to secure said arm to said motor support member;

a resilient member arranged between said first end of the support arm and said support element passageway for absorbing vibration between said motor support member and said support arms.

4,191,246

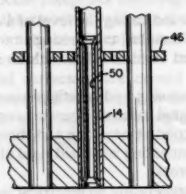
DEVICE TO REDUCE LOCAL HEAT FLUX THROUGH A HEAT EXCHANGER TUBE

Don S. Cassell, Chattanooga, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Mar. 5, 1979, Ser. No. 17,649

Int. Cl.² F28F *13/08, 9/00*

U.S. Cl. 165—134 R **5 Claims**



1. In a shell- and tube- heat exchanger for the generation of vapor by the indirect transfer of heat from a heating fluid to a vaporizable liquid, a pressure vessel, means to introduce vaporizable fluid into the bottom portion of the vessel, an outlet near the top through which vapor is discharged, a bundle of tubes positioned within the vessel, means for circulating heating fluid through the tubes, tube support means positioned within the pressure vessel for preventing tube vibration, the tube support means including horizontally positioned means closely surrounding, but slightly spaced from, each tube in the bundle of tubes at a given elevation, each tube containing an insulating sleeve secured within it, each insulating sleeve being smaller than the inner diameter of the tube it is positioned in, so as to form an annular space therebetween, each insulating sleeve being substantially closed at its upstream end regarding flow of heating fluid, so that the annular space is full of stagnant water forming an insulating barrier during operation, each insulating sleeve being at the same elevation as the tube support means.

4,191,247

HEAT EXCHANGERS

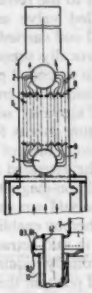
Jacobus C. Versteeg, Teteringen, Netherlands, assignor to B.V. Machinefabriek Breda v/h Backer & Rueb, Breda, Netherlands

Filed May 27, 1977, Ser. No. 801,067

Int. Cl.² F28F *9/02*

U.S. Cl. 165—158 **3 Claims**

1. A heat exchanger comprising a distribution header, a collection header, a plurality of groups of tubes for conducting a first medium from said distribution header to said collection header, each tube being provided with an inner tubular member for forming an annular space between the tubular member and the tube, distribution means connected to said distribution header and to each group of tubes for dividing the first medium into a plurality of streams, collection means connected to each group of tubes and to said collection header for combining streams of the first medium in said collection header, each distribution means and each collection means including a pipe connected to said distribution header and to said collection header, respectively, and a secondary header connecting a pipe to the tubes in a group of tubes, and an envelope surrounding said plurality of groups of tubes, said distribution and said collection means for guiding a second medium around said elements, characterized in that each secondary header comprises a pair of oppositely facing cup-shaped thin-walled flexible members, the edges of which are joined in a gas tight manner to form a header having spaced apart substantially parallel first and second walls, and in that a pipe is connected to said first wall, the tubes forming a group of tubes are connected to said second wall, and the tubular members provided in the tubes forming a group of tubes extend through said secondary header and are connected to said first wall, whereby the first medium flows from the distribution header through the pipes, secondary headers and the annular spaces between the tubes and their associated tubular members, and the second medium flows through the tubular members and around the outside surfaces of the tubes, secondary headers, and pipes of said distribution and collection means.



4,191,248

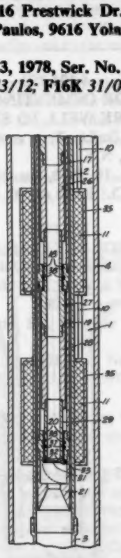
TANDEM SOLENOID-CONTROLLED SAFETY CUT-OFF VALVE FOR A FLUID WELL

Donald L. Huebsch, 3716 Prestwick Dr., Los Angeles, Calif. 90027, and Louis B. Paulos, 9616 Yolanda Ave., Northridge, Calif. 91324

Filed Jan. 3, 1978, Ser. No. 866,335

Int. Cl.² E21B *43/12;* F16K *31/08;* H01F *7/16*

U.S. Cl. 166—65 M **63 Claims**



41. A solenoid controlled device comprising: a plurality of coils separate magnetic armature means for each of said coils

and each biased to a different distance from its associated pole piece when said coils are de-energized, means operatively connected to and actuatable by said armature means as said armature means move in succession in out-of-phase relation into contact with their respective pole pieces when said coils are energized, and non-magnetic armature restraining means within said housing positioned to engage a portion of said armature means when in the retracted position thereof to hold said actuatable means open thereby permitting said solenoid coils to be energized with less power than initially required to move said armature means to the retracted position thereof.

59. A solenoid-controlled valve assembly comprising: a tubular housing, a solenoid coil carried coaxially of said housing armature means reciprocally supported coaxially of said coil and spring biased to an extended position but movable to a retracted position when said coil is energized, means providing a valve seat, a valve movably supported and operably associated with said armature means for movement between the open and closed positions thereof by movement of said armature means between the extended and retracted positions of said armature means, and non-magnetic armature restraining means positioned to engage said armature means when in the retracted position thereof thereby enabling said solenoid coil to hold said armature means in said retracted position with less power consumption than initially required to move said armature means to the retracted position thereof.

4,191,249

REDUCING THE RELATIVE WATER/PETROLEUM MOVEMENT IN A PETROLEUM PRODUCING RESERVOIR

Amir M. Sarem, Yorba Linda, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed Nov. 16, 1978, Ser. No. 961,091
Int. Cl.[2] E21B *33/138*
U.S. Cl. 166—244 C **11 Claims**

1. A method fo reducing the relative water/petroleum movement in a petroleum-containing water drive reservoir penetrated by one or more wells comprising:

(a) injecting into the reservoir a slug of an oil containing both an oil-soluble thickening agent and a solid particulate water-soluble thickening agent, and

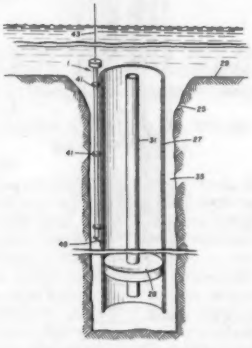
(b) producing the well.

4,191,250

TECHNIQUE FOR CEMENTING CASING IN AN OFFSHORE WELL TO SEAFLOOR

Joseph U. Messenger, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 18, 1978, Ser. No. 934,927
Int. Cl.[2] E21B *43/00, 49/00*
U.S. Cl. 166—253 **10 Claims**



1. In the drilling of a wellbore beneath a seafloor the method of cementing a casing string to the wellbore wall from the casing shoe to the seafloor, comprising:

(a) injecting a cement slurry down the casing string and into the annulus formed about the casing string;

(b) concomitantly sensing the hydrostatic pressure in the annulus at a preselected point spaced below the seafloor;

(c) transmitting a pressure signal related to the hydrostatic pressure of the cement slurry at the preselected point in the annulus through a column of incompressible liquid contained within a closed rigid conduit to a pressure transducer which generates a corresponding electrical signal;

(d) transmitting said electrical signal to a means for indicating when the cement slurry in the annulus rises to the seafloor;

(e) terminating the injection of cement slurry down said casing string when said cement slurry reaches the seafloor; and

(f) maintaining said cement slurry in said annulus to allow said slurry to set and bond said casing string to said wellbore wall.

5. Apparatus for indicating the level of a cement slurry in an offshore wellbore annulus, comprising:

(a) a rigid closed conduit filled with an incompressible liquid;

(b) a means for sensing hydrostatic pressure and transmitting a pressure signal relating thereto, connecting with said rigid closed conduit near one end thereof;

(c) a housing connecting with said rigid closed conduit at the other end thereof;

(d) a means for generating an electrical signal in response to a pressure signal mounted in said housing and having pressure communication with the interior of said rigid closed conduit; and

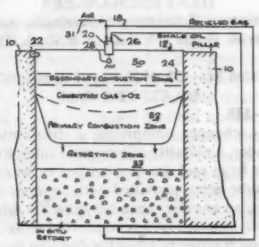
(e) an electrical conductor connecting with said means for transmitting an electrical signal in response to a pressure signal, said conductor passing through said housing for connecting with an indicating means.

4,191,251

PROCESS FOR RECOVERING CARBONACEOUS VALUES FROM IN SITU OIL SHALE RETORTING

Chang Y. Cha, Bakersfield, Calif., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Continuation of Ser. No. 844,035, Oct. 20, 1977, abandoned, which is a continuation-in-part of Ser. No. 728,911, Oct. 4, 1976, abandoned, which is a continuation-in-part of Ser. No. 648,358, Jan. 12, 1976, abandoned, which is a continuation of Ser. No. 465,097, Apr. 29, 1974, abandoned. This application Aug. 1, 1978, Ser. No. 930,022
Int. Cl.[2] E21B *43/24*
U.S. Cl. 166—260 **77 Claims**



39. A method for forming a secondary combustion zone in an in situ oil shale retort containing a fragmented permeable mass of particles containing oil shale and having a primary combustion zone advancing therethrough, which comprises the step of:

introducing a retort inlet mixture comprising a liquid fuel

and oxygen supplying gas into a selected location in the fragmented mass on the trailing side of the primary combustion zone, such that a secondary combustion zone is formed at said selected location.

4,191,252

METHOD FOR THE RECOVERY OF OIL

Peter S. Buckley, Dyce, Scotland, and Dennis M. Grist, Chertsey, England, assignors to The British Petroleum Company Limited, Sunbury-on-Thames, England

Filed May 19, 1978, Ser. No. 907,622

Claims priority, application United Kingdom, May 23, 1977, 21569/77

Int. Cl.² E21B *43/24*

U.S. Cl. 166—272 **3 Claims**

1. A process for the treatment of a viscous oil reservoir to increase the water permeability of the reservoir prior to steam injection which process comprises injecting a solvent for the oil down a well in the reservoir wherein the solvent is steam distillable, has an aromatic content of at least 25% and contains a primary alkylamine surfactant which is steam distillable so that the solvent and surfactant are caused to penetrate the reservoir by the steam and be present in the zone where the steam condenses the surfactant also being adsorbable on the reservoir rock so as to be adsorbed before reaching the production well.

4,191,253

SURFACTANT WATERFLOOD OIL RECOVERY METHOD

George Kalfoglou, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Dec. 11, 1978, Ser. No. 967,945

Int. Cl.² E21B *43/22*

U.S. Cl. 166—275 **16 Claims**

1. A method for recovering petroleum from a subterranean, petroleum-containing formation of known or determinable temperature and formation water salinity, said formation being penetrated by at least one injection well and by at least one production well, both wells being in fluid communication with at least a portion of the petroleum formation, comprising

(a) injecting into the formation via the injection well an aqueous, surfactant-containing fluid, said surfactant comprising a sulfated ethoxylated alkyl or alkylarylthiol having the following formula:

$$R—S—(OR')_nSO_3^-M^+$$

wherein R is an alkyl having from 6 to 26 carbon atoms, or an alkylaryl having from 5 to 24 carbon atoms in the alkyl chain, S is sulfur, O is oxygen, R' is ethylene or a mixture of ethylene and propylene with relatively more ethylene than propylene, n is a number from 1 to 12, and M is a monovalent cation, or a sulfonated ethoxylated alkyl or alkylarylthiol having the following formula:

$$R—S(OR')_nR''SO_3^-M^+,$$

wherein R'' is ethylene, propylene, hydroxy propylene or butylene, and R, S, O, R', n and M have the same meaning as above, or a mixture thereof, said surfactant fluid displacing petroleum through the formation to the remotely located production well; and

(b) recovering petroleum displaced by said surfactant fluid from the formation via the production well.

4,191,254

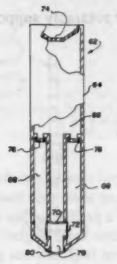
APPARATUS AND METHOD FOR PLUGGING VOIDS IN A GROUND STRATUM

Kenneth E. Baughman, 5035 Grape, Houston, Tex. 77096, and Earl N. Doyle, 1737 Campbell Rd., Houston, Tex. 77055

Filed Jan. 16, 1978, Ser. No. 869,707

Int. Cl.² E21B *33/13*

U.S. Cl. 166—286 **20 Claims**



12. A container for storing precursors of a polymeric foam in a liquid state and for mixing and releasing the precursors to form a solid material outside the container comprising, in combination;

means within said container for separating and storing the precursors, and

means responding to the pressure about said container for causing mixing of the precursors and subsequent releasing of the mixed precursors from the container, said means for causing mixing of the precursors including at least one plunger adapted to respond to the pressure about the container to mix, whereby by placing the container adjacent an area to be filled with foam and applying a pressure to the outside of the container, a solid foam can be directed into said area to be filled.

19. A method of dispensing a solid foam as it is forming from a container, comprising the steps of:

separately storing at least two liquid precursors in said container which are capable of forming the desired foam when combined in said container;

placing the container adjacent to the area to receive the solid foam material;

flowing a fluid under pressure about said container,

utilizing the pressure of said fluid to force the two precursors to mix together and simultaneously be driven out of the container into the area to receive the solid foam material; and

permitting the foam material to set in said area.

4,191,255

METHOD AND APPARATUS FOR CUTTING AND PULLING TUBULAR AND ASSOCIATED WELL EQUIPMENT SUBMERGED IN A WATER COVERED AREA

Allen K. Rives, Lafayette, La., assignor to Lor, Inc., Houston, Tex.

Filed Apr. 13, 1978, Ser. No. 895,739

Int. Cl.² E21B *23/00, 29/00, 31/02*

U.S. Cl. 166—297 **13 Claims**

1. A method of cutting and pulling tubular and associated well equipment submerged in a water covered area comprising the steps of:

a. lowering a well string including a cutting tool, a swivel and releasable spear in the water covered area to seat the swivel on the well equipment to thereby position the spear above the well equipment and the cutting tool within the well equipment to be cut and pulled;

b. actuating the cutting tool to sever the well equipment;

c. actuating the swivel to unseat it from the well equipment

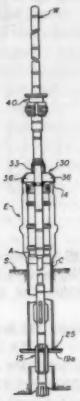
and lowering the well string to position the swivel and releasable spear within the severed well equipment; and

d. actuating the releasable spear to engage the severed well equipment for retrieval by first rotating and then pulling the well string out of the water covered area.

10. A swivel for use in a well string for conducting subsea operations on well equipment including:

a. an elongated hollow mandrel for connection in the well string;

b. an outer member rotatably supported on said mandrel;



c. circumferentially spaced support means extending outwardly of said outer member for seating on said well equipment while conducting the operations; and

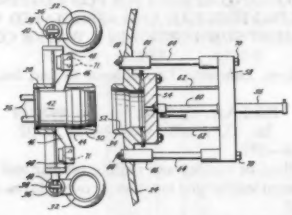
d. release means associated with said support means operable upon lowering the well string a predetermined amount while said support means is engaged with the well equipment to enable said support means to retract when the well string is thereafter raised whereby the well string may then be lowered to move the swivel into the well equipment.

4,191,256

SUBSEA FLOWLINE CONNECTOR

David G. Croy; Andrew J. Rafferty, and Richard D. Jolly, all of Houston, Tex., assignors to Cameron Iron Works, Inc., Houston, Tex.

Filed Apr. 21, 1978, Ser. No. 898,968
Int. Cl.² E21B 7/12
U.S. Cl. 166—343 **9 Claims**



1. A flowline connector for providing a connection from a production wellhead within a subsea dry production chamber to a flowline on the exterior of the chamber comprising

an actuator assembly positioned within a subsea production chamber and having at least one actuator and at least one actuator arm extending from said actuator through the wall of said chamber,

a carriage supported on the flowline,

at least one receptacle mounted on said carriage having a means for retaining the end of said actuator arm therein,

a piston secured to said receptacle and movably mounted on said carriage,

a flowline passage carried by said piston,

said chamber having a port for receiving said piston and said flowline passage,

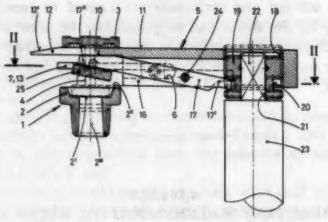
said actuator having sufficient travel to move said arm into engagement with said receptacle and to pull said piston into a sealed position within said port.

4,191,257

SPRINKLER-SEALING DEVICE

Johann G. Mohler, Laugneristrasse, CH-6353 Weggis, Switzerland

Filed Oct. 30, 1978, Ser. No. 955,825
Claims priority, application Switzerland, Dec. 23, 1977, 16013/77
Int. Cl.² A62C 37/20
U.S. Cl. 169—90 **3 Claims**



1. In a sprinkler system with a large number of sprinkler nozzles, a sprinkler-sealing device which can be coupled to a manually used operating rod system to activate a sealing element intended to individually seal a single sprinkler nozzle and interrupt the flow of water, comprising a recessed housing and guiding means to take up and position a control member and the sealing element, stop and centralizing means located on the front side of said housing for approximative alignment of the housing with the sprinkler nozzle to be sealed, spring-loaded fixing means movably connected with the housing for releasable connection of the housing to said sprinkler, a locking lever pivotably located in the housing in the plane of the sprinkler axis, one end of said locking lever carrying the sealing element intended to seal the nozzle opening of the sprinkler, and the control member comprising a spindle nut with a central take-up opening for the operating rod system located pivotably in a threaded hole of the housing and having a circular surrounding slot to operably engage the other operating end of the locking lever.

4,191,258

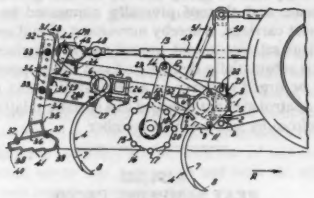
SOIL CULTIVATING IMPLEMENTS

Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed Jun. 15, 1977, Ser. No. 806,670
Claims priority, application Netherlands, Jun. 17, 1976, 7606554
Int. Cl.² A01B 27/00
U.S. Cl. 172—40 **28 Claims**

25. A soil cultivating implement comprising a frame with coupling means connectable to a prime mover, said frame having beam means extending transverse to the direction of travel and a plurality of cultivating tines mounted along the length of a beam of said beam means in a row, a supporting roller being connected to the frame with pivotable arms, setting means interconnecting said arms to the frame in any

chosen one of a plurality of positions to vary the level of said roller relative to said frame, an elongated soil working member with supports being resiliently interconnected to said beam and positioned at the rear of said roller and said beam, said beam being pivoted to the remainder of the frame by pivot means



and eccentric means connecting the soil working member to driving means, said eccentric being driven to reciprocate the soil working member together with beam and tines in substantially up and down movements about a common axis during operation.

4,191,259

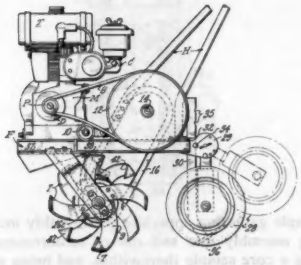
ROTARY CULTIVATOR AND MULCHER

Charles F. Boren, 16230 Orchard Ave., Gardena, Calif. 90247

Filed Jun. 19, 1978, Ser. No. 916,864

Int. Cl.[2] A01B *33/04*

U.S. Cl. 172—43 **9 Claims**



1. A rotary cultivator comprising in combination:

a support frame carrying at least one generally annular pair of axially-separated rotary members disposed for rotation on a transverse axis, each member of the pair comprising a plurality of radially extending cutting means having outer terminal blades, individually providing a transverse ground-penetrable edge,

roller means carried by the support frame spaced from said rotary members and adapted to go along a selected path of travel of the cultivator, with the terminal blades selectively disposed in ground clearance or ground penetration position,

the axial space which is intermediate said pair of rotary members and which extends outward from said axis to the terminal blades, having a pair of cutter blades disposed therein generally parallel to said axis and radially spaced apart, one fixed to said frame and the other being rotatable with said axis and rotary members, whereby upon movement of the cultivator against standing vegetation the latter may be severed and at least some cut into short pieces and churned into the ground by joint action of the terminal blades and the pair of cutter blades.

4,191,260

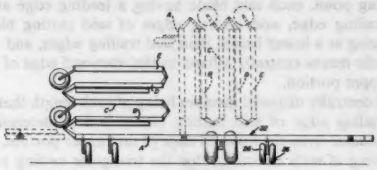
FOLDING WIDE PASS DRAFT IMPLEMENT

Duane O. Klindworth, P.O. Box 133, Hogeland, Mont. 59529

Filed Mar. 15, 1978, Ser. No. 886,944

Int. Cl.[2] A01B *73/00*

U.S. Cl. 172—311 **15 Claims**



1. A multi-section draft implement including a center towing section including front and rear ends and at least three side-by-side outer wing sections each defining a frame section of appreciable plan area and including front and rear ends, disposed to each side of said towing section, first means pivotally connecting the adjacent sides of the first wing sections adjacent said towing section to the corresponding sides of the towing section for upward and inward swinging of said first wing sections to upstanding positions over the adjacent side marginal portion of said center section with said adjacent sides lowermost, second means pivotally connecting the adjacent sides of the second wing sections from said center section to the adjacent sides of the first wing sections for relative swinging upwardly and inwardly into inverted, superposed and substantially parallel positions thereover, and third means pivotally connecting the adjacent sides of the third wing sections from said center section to the adjacent sides of the second wing sections for relative swinging into juxtaposed substantially parallel positions with said second sections and the undersides of each pair of second and third sections opposing each other.

4,191,261

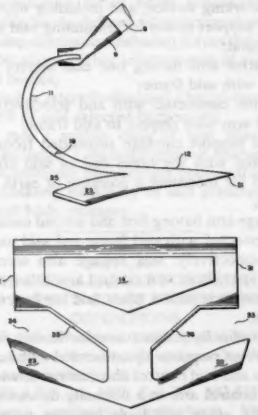
HAND OPERATED TOOL WITH CENTRAL OPENING IN UPPER PORTION

Phillip Tarantino, 6767 Northland Rd., Manteca, Calif. 95336

Filed Mar. 27, 1978, Ser. No. 890,044

Int. Cl.[2] A01B *1/10*

U.S. Cl. 172—371 **1 Claim**



1. In a hand operated tool for pulling through soil in a direction of travel toward the operator comprising: an arcuate upper portion having a forward edge and a rearward edge, said upper portion forming on the underside thereof a single, hori-

zontal, generally-cylindrical cavity with an axis substantially transverse to said direction of travel;

a downwardly curving centrally disposed member distending from said forward edge, said centrally disposed member terminating in a triangular cutting point; two rearwardly extending cutting blades diverging from said cutting point, each said blade having a leading edge and a trailing edge, said leading edges of said cutting blades being at a lower height than said trailing edges; and

handle means centrally affixed to the rearward edge of said upper portion,

said centrally disposed member being of such length that the trailing edge of said cutting blades is a predetermined distance from the forward edge of said upper portion, and being of such curvature that the triangular cutting point points generally rearwardly at a predetermined acute angle to said handle,

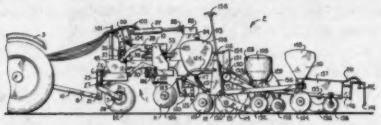
said arcuate upper portion being provided between said forward edge and said rearward edge with a generally central opening over a substantial area thereof, said opening having a top edge, two side edges and a bottom edge, said bottom edge sloping downwardly from the side edges to form a centrally located, v-shaped point in substantial alignment with said triangular cutting point.

4,191,262

AGRICULTURE LIGHT TILLAGE IMPLEMENT AND TOOL MOUNTING MECHANISM THEREFOR

Merton E. Sylvester, Rte. 3, Sabetha, Kans. 66534

Filed Sep. 1, 1978, Ser. No. 938,951
Int. Cl.[2] A01B *23/04, 25/00*
U.S. Cl. 172—459 **10 Claims**



9. An agriculture implement for light soil tillage immediately preceeding a trailing, agriculture earth working device, said implement comprising:

(a) a frame shaped for connection to a forward side of the earth working device, and including mobile ground engaging support means for translating said implement over the ground;

(b) a control arm having one end thereof pivotally connected with said frame;

(c) a motor connected with and selectively rotating said control arm with respect to said frame;

(d) a tool support carriage suspended from and operably connected with the other end of said control arm and adapted for mounting a plurality of earth working tools thereto;

(e) a linkage arm having first and second ends thereof pivotally connected with said frame and said tool support carriage respectively; said linkage arm second end being spaced apart from said control arm other end to securely retain tool orientation when said implement is in a tilling position;

(f) a longitudinally resilient member having first and second ends thereof respectively connected with said tool support carriage and said control arm other end, whereby rotation of said control arm in a normally downwardly direction resiliently urges said tools into the ground when said implement is in the tilling position;

(g) stop means limiting maximum separation between said tool support carriage and said control arm, and positively interconnecting the same when said implement is in a transport position, whereby rotation of the control arm in a normally upwardly direction lifts said tools out of engagement with the ground for transport; and

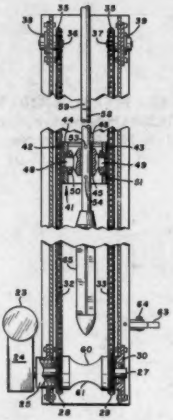
(h) a connector arm pivotally connecting said tool support carriage to said control arm, said connector arm having one end thereof pivotally connected to said control arm at a point spaced inwardly of said control arm other end, an opposite end thereof pivotally connected to said tool support carriage, whereby movement of said tool support carriage relative to said control arm in a horizontal direction is substantially limited, and said tool support carriage may be urged to move in a vertical direction relative to said control arm but is biased to a specific relative position therefrom by said resilient member.

4,191,263

PEAT SAMPLING PROBE

Thomas J. Malterer, Hibbing, Minn., assignor to State of Minnesota as represented by the Commissioner of Natural Resources, St. Paul, Minn.

Filed Jul. 26, 1978, Ser. No. 928,233
Int. Cl.[2] E21C *11/02*
U.S. Cl. 173—28 **4 Claims**



1. Sample gathering apparatus for drivably moving a core sampling assembly into and out of subterranean zones for gathering a core sample therewithin, and being arranged for mounting upon a vehicle, said sample gathering apparatus comprising:

(a) frame means, drive means mounted upon said frame means for moving said core sampling assembly into and out of subterranean zones, and coupling means for releasably securing said drive means to said core sampling assembly;

(b) said frame means being elongated and including:

(1) a first pivotal joint for adjustably mounting said sampling apparatus upon a vehicle; and

(2) means for mounting said drive means upon said frame and for delivering power to said coupling means;

(c) said drive means including:

(1) motor means for delivering power to said coupling means;

(2) an elongated endless belt mounted for movement along a first drive plane and being driven by said motor means and having said coupling means secured thereto and arranged for motion therewith, said coupling means including a core sample assembly retainer;

(3) said core sample assembly retainer including a receiving hub pivotally secured to said endless belt and arranged for pivotal motion about a swing axis generally transverse to said drive plane, with said hub having

means for releasably securing said core sampling assembly thereto;

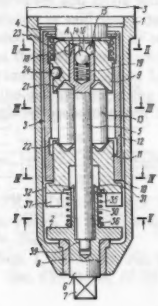
(d) said frame means further having upper and lower segments with the lower segment being formed with an open front surface so as to permit said core sampling assembly to swing pivotally outwardly of said frame means about said swing axis for pivotal lifting of said core sampling assembly from the ground surface and about said swing axis; and

(e) said receiving hub and said core sampling assembly being coaxially disposed, and wherein the coupling between said hub and core sampling assembly is a pin means, with a pair of bores being formed within said core sampling means, and with each bore being disposed generally along the axis of said core sampling means, with one of said bores being disposed above said swing axis and with the other being disposed below said swing axis.

4,191,264
IMPACT WRENCH

Georgy A. Antipov, ulitsa Krasny Mayak, 3, kv. 146; Mikhail L. Gelfand, Yaroslavskoe shosse, 129, kv. 44, both of Moscow; Nikolai S. Lavnikov, ulitsa Kustanaiskaya, 117, kv. 10, Rostov-na-Donu; Leonid N. Teres, ulitsa 2 Koltsevaya, 61/21, Rostov-na-Donu; Ivan I. Urazhdin, ulitsa Engelsa, 52/56, kv. 18, Rostov-na-Donu; Yakov I. Tsipenjuk, ulitsa Kirova, 5, kv. 30, Solntsevo Moskovskoi oblasti, and Petr S. Yakubovsky, Podshipnikovy pereulok, 12, kv. 36, Rostov-na-Donu, all of U.S.S.R.

Filed Jan. 6, 1978, Ser. No. 867,580
Claims priority, application U.S.S.R., Apr. 26, 1977, 2470156
Int. Cl.[2] B25D *15/00*
U.S. Cl. 173—93.6 **2 Claims**

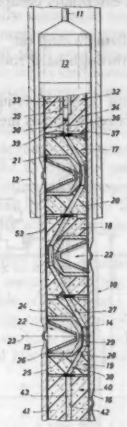


1. An impact wrench comprising a housing; an impact clutch accommodated in said housing and comprising an anvil and a hammer which includes a driving member and a driven member interconnected for combined rotation and for axial movement of the driven member relative to the driving member of the hammer for engagement with the anvil; rotary drive means for the hammer accommodated in said housing and comprising a yieldable coupling including a drive shaft having a blind bore; said driving member surrounding said drive shaft and being arranged coaxially therewith; said drive shaft having radial bores; balls arranged substantially within the blind bore and partially protruding therefrom through said radial bores; said driving member having a friction surface facing said radial bores of said drive shaft, said friction surface being constituted as a continuous inner annular groove arranged in a plane substantially at right angles to the longitudinal axis of the drive shaft and eccentrically with respect to said driving member; and a spring-loaded pressure member in said blind bore exerting axial pressure on said balls, whereby said balls engage the bottom and walls of said annular groove.

4,191,265
WELL BORE PERFORATING APPARATUS

Michel J. Bosse-Platiere, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Jun. 14, 1978, Ser. No. 915,498
Int. Cl.[2] E21B *43/117*
U.S. Cl. 175—4.56 **27 Claims**



1. Perforating apparatus adapted for operation in a well bore and comprising:

a tubular carrier having an end opening providing access to the interior bore of said carrier;

a plurality of bodies adapted to be successively introduced through said end opening and tandemly assembled within said interior bore with their opposite ends respectively abutting one another;

charge-detonating means including an elongated passage entirely through each body, each passage of one body communicating with the passage of the abutting body for collectively defining a generally-longitudinal intercommunicating passage through said tandemly assembled bodies, and a detonating explosive cooperatively arranged within each of said body passages and closed entirely in each body by closure means on each end of the body, said detonation-inducing forces being communicated solely via said collectively defined intercommunicating passage for producing detonation-inducing forces therein at predetermined locations within selected ones of said tandemly-assembled bodies;

means defining a laterally-directed charge-receiving opening on each of said selected bodies; and

perforating means within each of said charge-receiving openings including a shaped explosive charge including a detonation-initiating base portion cooperatively arranged within detonating proximity of said predetermined locations in said body passages.

4,191,266
PROCESS AND INSTALLATION FOR DRILLING HOLES IN THE EARTH'S CRUST UNDER FREEZING CONDITIONS

Wouter H. van Eek, Wassenaar, and Arnold W. J. Grupping, Aerdenhout, both of Netherlands, assignors to Wouter H. van Eek, Wassenaar, Netherlands

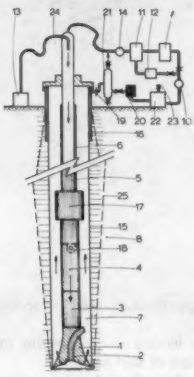
Filed Feb. 28, 1978, Ser. No. 882,621
Claims priority, application Netherlands, Mar. 4, 1977, 7702354
Int. Cl.[2] E21B *7/00*
U.S. Cl. 175—17 **21 Claims**

1. In a process for drilling holes in the earth's crust through

strata containing unconsolidated earth formations utilizing a hollow drilling string extending the length of said hole and terminating at its lower end with a drill bit, wherein a mud containing drilling fluid is cooled to a temperature below the freezing point of water contained in said earth formations and introduced into the upper portion of said drilling string and circulated through said hole in contact with said earth formations, the improvement essentially comprising the combination of:

drilling said hole utilizing a drill bit adapted for drilling through hard rock formations;

forming a cold drilling liquid containing solid particles of a frozen aqueous medium;



introducing said frozen particle containing cold drilling liquid into the upper portion of said drilling string; and

circulating said cold drilling liquid to the bottom of said hole through said drilling string and into contact with said unconsolidated earth formations thereby causing at least a portion of said solid particles of frozen aqueous medium to melt;

said circulating cold drilling liquid having sufficient frigories to solidify said unconsolidated earth formations at the bottom of said hole by freezing said water contained in said formations at a rate and depth sufficently in advance of said drill bit whereby balling is substantially avoided.

4,191,267

RAISE-BORING

Michael B. Snaddon, 47 Duncan Rd., Glenferness, Agricultural Holdings, Transvaal, South Africa

Filed Jan. 19, 1978, Ser. No. 870,809

Claims priority, application South Africa, Jan. 19, 1977, 77/0289

Int. Cl.[2] E21D *3/00*

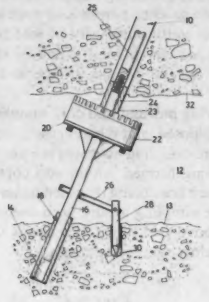
U.S. Cl. 175—53 **6 Claims**

1. A method of collaring a drill hole from a tunnel in the art of raise-boring which includes the steps of:

drilling a pilot hole with a pilot drill in one wall of the tunnel,

advancing the pilot drill across the tunnel to drill an opposed hole aligned with the pilot hole, in the opposite wall of the tunnel,

mounting a borer head on an arbour,



locating the arbour across the tunnel in both holes, rotating the borer head to collar the drill hole, and detaching the borer head from the arbour.

4,191,268

DIGITAL WEIGHING MACHINE

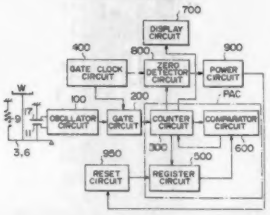
Tsutomu Miyoshi; Shuichi Yanagita, and Yushi Komachi, all of Tokyo, Japan, assignors to Tanita Corporation, Tokyo, Japan

Filed Feb. 15, 1978, Ser. No. 877,840

Claims priority, application Japan, Feb. 22, 1977, 52/21061; Apr. 12, 1977, 52/42203

Int. Cl.[2] G01G *3/02*

U.S. Cl. 177—210 C **7 Claims**



1. A digital weighing machine comprising a base, a metering spring fixed at one end thereof to said base, a load supporting link mounted between said base and the other end of said metering spring and movable to displace the metering spring according to the weight of a body to be measured when applied to the load supporting link, a fixed electrode plate consisting of an electrically conductive flat plate secured to said base, a movable electrode plate consisting of an electrically conductive flat plate disposed opposite to said fixed electrode plate to provide an electrostatic capacitance therebetween and interlocked with said load supporting link so as to move away from or towards said fixed electrode plate with said movement of said load supporting link, an oscillator circuit including said electrostatic capacitance as a frequency determining parameter for generating an electric output having a frequency which varies with the change in said capacitance according to the weight of said body, a counter circuit for directly counting the frequency of the electric output from said oscillator circuit to provide a count representative of the weight of said body, a digital display for displaying the count from said counter, and an electric power circuit for said oscillator circuit, counter circuit and display, wherein said movable electrode plate is

supported in a movable point contact relation with said load supporting link by a link pin and a spring is provided between said movable electrode plate and said load supporting link for keeping the point contact pressure constant at any time.

4,191,269

VEHICLE BODY FRAME ARRANGEMENT

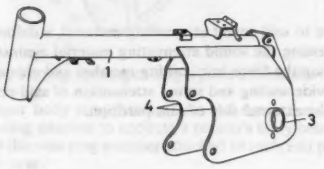
Tomoyuki Nagashima, Tokorozawa; Masayuki Tanaka, Wako, and Shigeo Shinomiya, Asaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 11, 1978, Ser. No. 923,945

Claims priority, application Japan, Jul. 15, 1977, 52-93469[U]

Int. Cl.[2] B62D *21/04;* B62K *19/10*

U.S. Cl. 180—217 **5 Claims**



1. A vehicle body frame arrangement comprising a main longitudinal pipe member, a pair of left and right side plates secured to said main pipe and depending therefrom in spaced relation, a lateral pipe member secured to said side plates, a wheel shaft rotatably supported in said lateral pipe member and projecting beyond the ends thereof, a first cover member secured to one of said side plates to form a first compartment therewith, a chain sprocket and chain mounted on said wheel shaft and accommodated in said first compartment, a second cover member secured to the other of said plates to form a second compartment therewith, and brake means mounted in said second compartment for applying braking force to said wheel shaft, said brake means comprising a brake drum on the wheel shaft and brake shoes supported by the other of said plates.

4,191,270

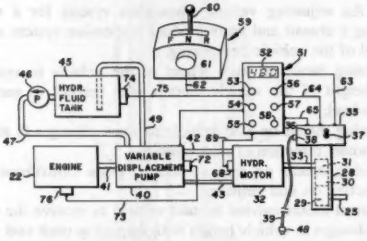
CONTROL FOR TRACTOR POWER TAKEOFF SHAFT

Donald A. Monteith, Fargo, N. Dak., assignor to Steiger Tractor, Inc., Fargo, N. Dak.

Filed Sep. 1, 1977, Ser. No. 829,642

Int. Cl.[2] B60K *17/28*

U.S. Cl. 180—53 D **16 Claims**



1. In combination:

a tractor having means for propelling the same along the ground, an engine for driving said propelling means, an operator's compartment, and means including an operator's control in said operator's compartment for varying the speed of the engine;

a motor operatively connected to said engine and driven thereby;

a power takeoff shaft driven by said motor;

a manually adjustable control for said motor and movable from a neutral position through an intermediate range of positions to an end position;

motor control means responsive to the position of said manually adjustable control, said motor control means including first means for interrupting operation of said motor when said manually adjustable control is in said neutral position, second means for causing said motor to drive said power takeoff shaft at a speed dependent upon the speed of the engine when said manually adjustable control is in said intermediate range of positions, the ratio of the speed of said shaft to the speed of the engine being dependent upon the position of said manually adjustable control in said intermediate range of positions, and third means for causing said motor to operate said shaft at a predetermined speed regardless of the speed of the engine as long as the engine speed is adequate to maintain said speed, when said manually adjustable control is in said end position;

further means effective upon actuation thereof to interrupt operation of said motor regardless of the position of said manually adjustable control; and

means for preventing resumption of the operation of said motor following such an interruption until said manually adjustable control has been returned to said neutral position.

4,191,271

GEARSHIFT LINKAGES FOR TILT-CAR VEHICLES

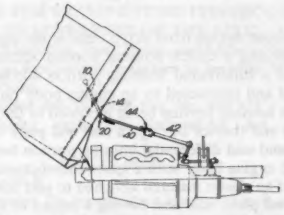
Stephen N. W. Fox, Luton; Edward H. Snook, Newport Pagnall, both of England, and Norman F. Stimson, deceased, late of Luton, England (by Verity S. Stimson, personal representative), assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 4, 1978, Ser. No. 948,571

Claims priority, application United Kingdom, Oct. 6, 1977, 41623/77

Int. Cl.[2] B60K *20/04;* G05G *9/12*

U.S. Cl. 180—77 TC **5 Claims**



1. A gearshift linkage for transmitting movement of a gear lever mounted in the cab of a tilt-cab vehicle to a ratio-change transmission carried by a chassis portion of the vehicle, comprising a gear lever which is pivotally mounted intermediate its ends in a spherical bearing and includes a lower lever portion, a U-section yoke comprising a pair of spaced side members interconnected by a transverse member, means pivotally connecting the yoke by way of the side members thereof to the lower portion of the gear lever, a locating projection extending from the transverse member in the opposite direction to the side members, an elongate inner tube member connected at one end thereof to the transverse member and extending therefrom in the opposite direction to the side members, an elongate outer tube member telescopically accommodating the inner tube member and providing a connection to linkage for actuating the ratio-change transmission, a channel-section housing member secured by way of side walls thereof to an end region of the outer tube member, facing surfaces of the side walls of the channel-section housing member arranged for co-operation

with the locating projection, a latching pawl pivotally mounted on the housing member between the side walls thereof, means spring-biasing the latching pawl towards a portion for providing latching engagement with the transverse member, and a detent member projecting from the lower end region of the lower lever portion of the gear lever and arranged, during tilting movement of the cab of the vehicle from its normal operational position, in which the pawl is in its position of latching engagement with the transverse member, to engage a cam surface of the pawl to cause the pawl to pivot to an unlatched position permitting telescopic extension of the inner and outer tube members, subsequent return movement of the cab of the vehicle to its normal operational position causing telescopic shortening of the inner and outer tube members until the locating projection co-operates with the facing surfaces of the side walls of the housing member and the pawl again assumes its position of latching engagement with the transverse member.

4,191,272

DUST SEAL

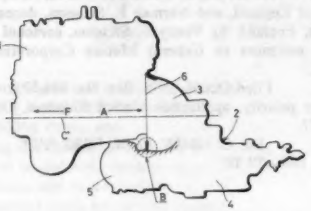
Akio Kuramoto, Okazaki, and Takeo Kawai, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 7, 1978, Ser. No. 958,365

Claims priority, application Japan, May 24, 1978, 53-71031[U]

Int. Cl.² B62D 25/16; F02B 77/00

U.S. Cl. 180—84 **5 Claims**



1. In a front engine-front drive vehicle having a trans-axle case comprising a clutch housing portion accommodating a clutch and a differential housing portion accommodating a differential and connected to an engine body on the vehicle, said clutch housing portion being mounted to the engine body at the rear end thereof through a rear end plate having a bottom edge and said differential housing portion being arranged below said engine body with a space therebetween, a laminar dust seal of an elastic material attached to said bottom edge of said rear end plate, said seal having a means to seal an upper surface of said differential housing portion at the lower portion thereof and a means to cover a front portion of side walls of said clutch housing portion on either side thereof.

4,191,273

SEAL AND SOUND ATTENUATOR FOR CONTROL CONSOLE

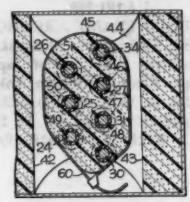
Hugh K. Williams, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Jun. 5, 1978, Ser. No. 912,846

Int. Cl.² G10K 11/00

U.S. Cl. 180—89.13 **10 Claims**

1. A sound attenuating device on a vehicle comprising, a vehicle chassis, a platform mounted on said chassis defining an operator station, a control console mounted on said platform defining an interior compartment, at least one lever mounted in the compartment of said control console for operating a control function of the vehicle, a partition delineating the compartment of said control console forming an exterior wall, deformable sound attenuating material mounted on said partition covering the exterior wall and defining a plurality of holes, a force transmitting member connected to said lever and extending through one of said holes in said sound attenuating material and said partition, a casing enclosing said force transmitting member mounted in one of said holes and stationary



relative to said sound attenuating material, a deforming member pressing the sound attenuating material against the casing enclosing the force transmitting member and closing the holes to provide sealing and sound attenuation of said compartment from the external side of said partition.

4,191,274

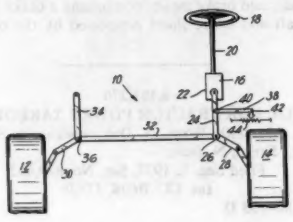
ADJUSTING AUTOMOBILE SUSPENSION SYSTEM

Jerome Goldberg, Cold Spring, and Christopher D. Bloch, Hillsdale, both of N.Y., assignors to Spring Hill Laboratories, Inc., Cold Spring, N.Y.

Filed Aug. 22, 1977, Ser. No. 826,709

Int. Cl.² B62D 7/20

U.S. Cl. 180—282 **10 Claims**



1. An adjusting vehicle suspension system for a vehicle having a chassis and an individual suspension system at each wheel of the vehicle comprising

sensing means at each wheel of the vehicle to sense the height of the vehicle chassis with respect to each said wheel;

sensing means on said vehicle to sense changes in steering wheel direction of said vehicle;

sensing means on said vehicle to sense centrifugal force acting on said vehicle;

control means carried by said vehicle to receive the sensed changes in vehicle height with respect to each said wheel, changes in steering wheel direction of said vehicle and centrifugal force acting on said vehicle;

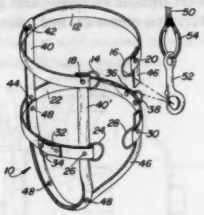
said control means including means for controlling camber adjustment means at each said wheel to effect changes in wheel camber to maintain optimum road contact between each said wheel and the road according to a predetermined camber for each wheel based on a correlation of the centrifugal force acting on the vehicle displacement of the vehicle sensed at each wheel.

4,191,275

SAFETY HARNESS KIT

Martin J. Mansfield, Jr., Philadelphia, Pa., assignor to Cla-Mar International Corp., Philadelphia, Pa.

Filed Oct. 6, 1978, Ser. No. 949,334
Int. Cl.[2] A62B 1/16
U.S. Cl. 182—3 9 Claims



1. A safety harness for suspending a person from above by a rope comprising:

(a) an upper body strap having first and second ends, said strap being adapted to encircle a person's body below the arms, a discrete ring member attached to each end portion of said strap,

(b) a lower body strap beneath said upper body strap, said lower body strap having first and second ends and being adapted to encircle an adult's waist or a child's body under the arms, a discrete ring member attached to each end portion of said lower body strap,

(c) a rear strap connected to a middle portion of each of said body straps,

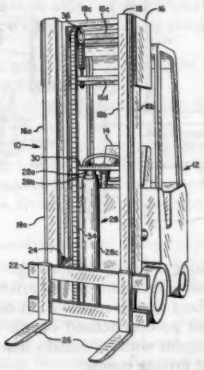
(d) a first front strap portion connected to each of said body straps adjacent their first ends, a second front strap portion connected to each of said body straps adjacent their second ends, and part of said front strap portions remote from said upper body strap being secured together in overlapping relation for supporting a person by being disposed between the person's legs, and the harness being open between said front strap portions.

4,191,276

HIGH-VISIBILITY TWO-STAGE MAST ASSEMBLY FOR LIFT TRUCKS

Stanley E. Farmer, Troutdale, and Harlan D. Olson, Sandy, both of Oreg., assignors to Cascade Corporation, Portland, Oreg.

Filed Mar. 6, 1978, Ser. No. 884,005
Int. Cl.[2] B66F 9/06
U.S. Cl. 187—9 E 7 Claims



1. A high-visibility load-lifting structure for an industrial lift truck or the like comprising an elongate, extensible-contractable telescopic mast having an extensible end, said mast including a first elongate mast section for mounting vertically on said truck and a second elongate mast section longitudinally and movably mounted upon said first mast section for vertical extension therefrom, each of said mast sections having a top and comprising a pair of transversely-spaced apart elongate upright members, a load carriage movably mounted upon said second mast section and extending forwardly therefrom for vertical reciprocation with respect thereto along a predetermined vertical path of travel, and a fluid-actuated, extensible-contractable fluid ram assembly comprising multiple relatively reciprocable elongate ram portions for selectively moving said load carriage and said second mast section with respect to said first mast section, said ram portions being telescopically longitudinally mounted on said first mast section in a position transversely between the upright members thereof, a first one of said ram portions having an extensible end which is more extensible in a longitudinal direction than any other of said ram portions, the extensible end of said first ram portion being located nearer to the longitudinal midpoint of said mast than to the extensible end thereof when said mast and ram assembly are fully contracted, a rigid transverse member connected to the extensible end of said first ram portion extending transversely therefrom and fixedly attached to each of the upright members of said second mast section at locations rearwardly of said predetermined vertical path of travel of said load carriage so as to avoid interference with the vertical reciprocation thereof, a pair of transversely-spaced sheaves rotatably mounted adjacent the top of said second mast section above said transverse member and extending rearwardly of said transverse member, and a pair of elongated flexible tension elements trained over said respective sheaves, each tension element being connected at one end to said first mast section and at the other end to said load carriage, said first ram portion engaging said second mast section during extension of said ram assembly from its fully-contracted position in such a manner as to begin extending said second mast section at the same speed as that of said ram assembly while the extensible end of said first ram portion remains nearer to the longitudinal midpoint of the fully-contracted mast than to the extensible end thereof.

4,191,277

APPARATUS FOR TRANSMITTING CONTROL SIGNALS TO ELEVATORS OR THE LIKE

Fritz Meyer, Küssnacht; Josef Heine, and Ladislav Vig, both of Ebikon, all of Switzerland, assignors to Inventio AG, Hergiswil, Switzerland

Filed Jul. 19, 1978, Ser. No. 926,221
Claims priority, application Switzerland, Jul. 29, 1977, 9405/77
Int. Cl.[2] B66B 1/16
U.S. Cl. 187—29 R 4 Claims

1. An apparatus for transmitting control signals to a transportation system, such as an elevator having an elevator cabin travelling in an elevator cabin chute, comprising:

means for transmitting in coded form floor call and cabin call signals as well as cabin position signals;

storage means including call storages for storing the coded floor call signals and cabin call signals and a cabin position storage for storing cabin position signals;

a comparator for comparing the floor call signals and cabin call signals with the cabin position signals and for producing a respective control signal determinative of the direction of travel of the elevator cabin and the stop of such elevator cabin;

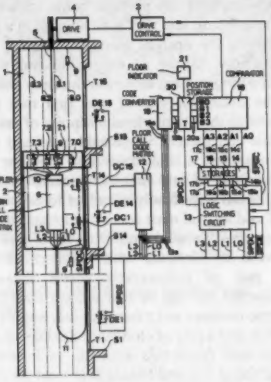
means for coding the floor call signals and cabin call signals;

said coding means comprising a respective cabin diode matrix and floor diode matrix each having outputs and inputs;

said call storages having inputs and outputs;

said transmitting means including common call lines for connecting the outputs of the diode matrixes with the inuts of the call storages;

a coding device for coding the cabin position signals;
said coding device comprising switches attached to the elevator cabin and actuation elements arranged in the elevator cabin chute;
the cabin position code comprising a Gray code;
one said actuation element being provided for each floor change;
each actuation element being associated with a changing binary place of the respective code word correlated to each floor;
coupling means having diodes;
each diode of the coupling means being connected in series with a respective one of the switches;



each said switch being connected by means of the therewith series connected diode of the coupling means with the outputs of the cabin diode matrix and by means of the call lines with inputs of the cabin position storage;
logic switching circuit means which, during travel of the elevator cabin and for a time span after stoppage of the elevator cabin, switch the diodes of the cabin and floor diode matrixes into the reverse direction and the diodes of the coupling means into the forward direction and disconnect the call lines from the call storages;
said logic switching circuit means during the remainder of the time of stoppage of the elevator cabin switching the diode matrixes into the forward direction and the diodes of the coupling means into the reverse direction and connecting the call lines with the call storages.

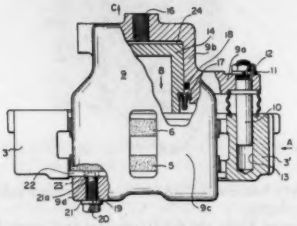
4,191,278

SLIDABLE SUPPORT STRUCTURE FOR A DISC BRAKE CALIPER

Yasuo Karasudani, Yokohama, Japan, assignor to Tokico Ltd., Kanagawa, Japan

Filed Jun. 8, 1976, Ser. No. 694,037
Claims priority, application Japan, Jun. 18, 1975, 50/74172
Int. Cl.[2] F16D *65/02*
U.S. Cl. 188—73.3 **2 Claims**

1. A disc brake comprising a disc having an axis and first and second opposite faces; a torque taking member fixed relative to said disc and provided with slide surfaces; first and second friction elements provided with slide surfaces and disposed adjacent to said first and second opposite faces respectively, said slide surfaces of said first and second friction elements cooperating with said slide surfaces of said torque taking member such that said first and second friction elements are slidably carried and at least said first friction element is restraind against movement radially of said axis of said disc by said torque taking member; a caliper member arranged to straddle said disc and to move said first and second friction elements against said first and second opposite faces respectively for braking, said caliper member having front and rear limbs disposed adjacent said first and second friction elements respectively, a crown portion joining said limbs, and first and second sides; a slidable assembly mounting said caliper member on said torque taking member, said assembly comprising only a single pin extending directly between said caliper and torque taking members, releasable connection means securing said single pin to one of said torque and caliper members on said first side of said caliper member, and an opening in the other of said torque and caliper members slidable receiving said pin, said pin being spaced from said friction elements, and inter-engaging projection and recess means on said first friction element and said caliper member on said second side of said caliper member and comprising a recess in a portion of said first friction element defined by an elongated slot whose longitudinal dimension is greater than its transverse dimension, said longitudinal dimension extending generally towards the axis of the pin, and a projection carried by said caliper member and engaged within said slot so as to hold said caliper member against pivotal movement about the axis of said pin, said projection having play along said slot.

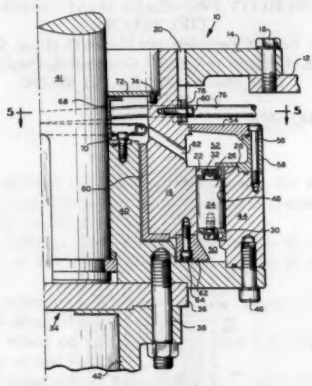


4,191,279

SELF LUBRICATING ONE WAY COUPLING

Robert J. Brown, Ann Arbor, Mich., assignor to Dana Corporation, Toledo, Ohio

Filed Dec. 30, 1977, Ser. No. 865,975
Int. Cl.[2] F16D *63/00*
U.S. Cl. 188—82.84 **7 Claims**



1. A self lubricating coupling comprising:
a generally cylindrical uni-directional driving means;
a first member fixed against rotation and including a generally cylindrical portion defined on the exterior thereof drivingly engagable with the radially inner portion of said uni-directional driving means;
a second member adapted for connection to a rotating machine and including a generally cylindrical portion de-

fined on an interior wall portion thereof drivingly engagable with the radially outer portion of said uni-directional driving means;

an annular fluid lubricant sump defined by an interior wall portion of said second member; and

fluid circulating means carried by said first member and disposed in said sump, said fluid circulating means including a plurality of generally radially extending spirally formed fluid passageways in facing spaced relation to an interior wall portion of said second member, whereby upon relative motion of said second member with respect to said first member fluid is circulated.

4,191,280

MECHANICAL LINK MEMBERS

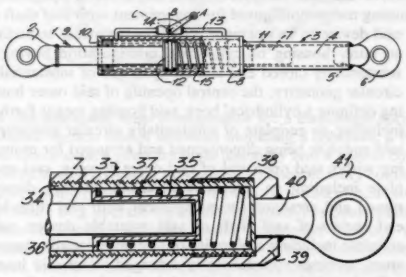
Cyril Copperwheat, Ampthill, England, assignor to Uni-Drive (Tractors) Limited, Bedfordshire, England

Filed Aug. 17, 1977, Ser. No. 825,356

Claims priority, application United Kingdom, Aug. 23, 1976, 35067/76; Jan. 5, 1977, 00239/77

Int. Cl.[2] F16F 9/44

U.S. Cl. 188—300 **4 Claims**



1. A variable length mechanical link member for force transmission, comprising:

two link member elements having first ends for connection to respective machine elements and second ends cooperating together to form a double acting piston and cylinder unit,

fluid flow conduit means interconnecting the cylinder spaces of said piston and cylinder unit,

fluid flow control means in said conduit for interrupting fluid flow between the cylinder spaces,

one of said link member elements being formed as a piston rod and having a piston mounted between the first connected end of said element and the free end of said piston rod, said piston dividing the cylinder into separate cylinder spaces,

the other link member element comprising a first tubular portion forming said cylinder and a second tubular portion forming a closed-end bore in which is received the free end of said piston rod,

a flanged cup-shaped element in said closed-end bore to accommodate said free piston rod end, and

spring means acting between the flange and the closed-end of the bore urging said cup-shaped element against said free piston rod end.

4,191,281

DAMPING-FORCE CONTROL MECHANISM IN A HYDRAULIC SHOCK ABSORBER

Masao Nishikawa, Tokyo, and Hitoshi Yamamoto, Asaka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 30, 1978, Ser. No. 920,997

Claims priority, application Japan, Feb. 18, 1978, 53-17850

Int. Cl.[2] F16F 9/44

U.S. Cl. 188—319 **6 Claims**

1. A damping force control apparatus for use with a hydraulic shock absorber comprising a piston disposed within a cylinder casing defining a pair of hydraulic chambers, passage means formed in said piston to enable passage of fluid between said chambers, an orifice plate mounted on said piston for stepwise rotation relative thereto, a plurality of orifices formed through said orifice plate and each having a cross sectional area different from each other and smaller than said passage means for controlling flow of fluid passing therethrough by stepwise rotation of said orifice plate relative to said piston, said orifices being disposed in angularly spaced relationship in such a circular pattern that at least two of said orifices, which communicated with said passage means upon the last stepwise rotation of said orifice plate, remain in the communication state upon a further stepwise rotation of said orifice plate and at least one of said orifices, which was out of communication with said passage means upon the last stepwise rotation of said orifice plate, is placed into communication with said passage means upon said further stepwise rotation of said orifice plate with a corresponding number of said orifices, which were in communication with said passage means upon the last stepwise rotation of said orifice plate, being placed out of communication with said passage means upon said further stepwise rotation of said orifice plate.

4,191,282

DEVICE FOR TIGHTENING A SCREW JOINT

Knut C. Schoeps, Tyreso, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Mar. 15, 1978, Ser. No. 886,774

Claims priority, application Sweden, Mar. 22, 1977, 7703257

Int. Cl.[2] F16P 5/00; F16D 43/20

U.S. Cl. 192—0.034 **8 Claims**

1. In a device for tightening screw joints, comprising a pressure fluid motor, an overload, friction type slip clutch including a driving half (**11**) and a driven half (**13**), an output shaft (**14**) for connection to a screw joint member, a pressure fluid shut off valve (**38**), and a release mechanism for initiating closing of the shut off valve at overload clutch slipping,

the improvement comprising:

a male member (**48**) which is associated with one of said clutch halves for co-rotation therewith,

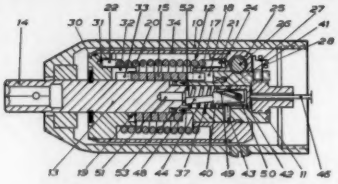
a female member comprising a bore (**51**) and which is associated with the other of said clutch halves for co-rotation

therewith, and which is adapted to engagingly receive said male member (48),

one of said male and female members (48,51) being movable relative to the other between a laterally offset position and an axially aligned position, and being also axially movable relative to the other between an engaged position and a separated position,

first biasing means (49) for biasing said one of said male and female members (48,51) toward said laterally offset position,

second biasing means (47) for biasing said one of said male and female members axially toward said engaged position, and



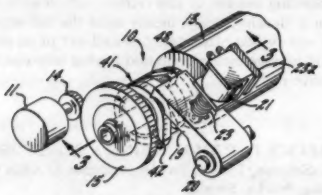
guide means comprising two circular recesses (52,53) arranged such that the cross-section of at least said bore (51) is disposed within the cross-sectional confines and is tangent to at least one of said circular recesses (52,53), said circular recesses being located at the male member (48) facing end of said bore (51) and associated with said male and female members (48,51) for urging, against the action of said first biasing means (49), said male and female members (48,51) relative to each other from said laterally offset position to said axially aligned position upon relative rotation between said clutch halves (11,13), thereby providing for relative axial movement of said members (48,51) from said separated position to said engaged position by action of said second biasing means (47).

4,191,283

HELICAL SPRING COUPLING WITH PROGRAMMABLE CONTROL COLLAR

Harry F. Keeny, III, Turnersville, N.J., assignor to Warner Electric Brake & Clutch Company, South Beloit, Ill.

Filed Aug. 24, 1978, Ser. No. 936,491
Int. Cl.[2] F16D *11/06*
U.S. Cl. 192—26 **7 Claims**



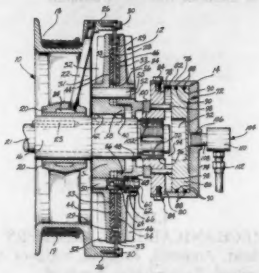
1. A selectively engageable and disengageable coupling having at least one rotatable member, a helical spring telescoped with said member, an intermittently rotatable control collar operable to expand and contract said spring relative to said member to change the state of engagement of said coupling, and an interposer selectively movable between inactive and active positions permitting and preventing rotation of said collar, said collar comprising a sleeve coaxial with said rotatable member and connected to said spring, a plurality of stops spaced axially along said sleeve and operable to engage said interposer to prevent rotation of said collar when said interposer is in said active position, and means mounting said stops for selective angular adjustment relative to one another one said sleeve and enabling the angular spacing between said stops to be selectively changed.

4,191,284

CLUTCH WITH FLUID ACTUATOR

Gerald D. King, Bradfield Canal, Ketchikan, Ak. 99901

Continuation-in-part of Ser. No. 677,379, Apr. 15, 1976, abandoned. This application Feb. 3, 1978, Ser. No. 874,784
Int. Cl.[2] F16D *25/00*
U.S. Cl. 192—85 AA **2 Claims**



1. A fluid operated actuator for operating a rotatable device of the type wherein said device is engaged for rotation with a shaft by axially displacing an annular region of said device which concentrically surrounds said shaft and wherein the end portion of said shaft includes threads, said actuator comprising:

housing means configured for engagement with said shaft of said device to be operated, said housing means including an outer housing of cylindrical configuration having a substantially closed end and an open end of substantially circular geometry, the central opening of said outer housing defining a cylindrical bore, said housing means further including an endplate of substantially circular geometry, said endplate being dimensioned and arranged for mounting within said open end of said outer housing, said endplate including an internally threaded opening dimensioned and arranged for engagement with said threaded end region of said shaft of said rotatable device, said endplate including a plurality of circumferentially spaced apart openings symmetrically arranged about said internally threaded opening, said endplate further including an annular shoulder surrounding said internally threaded opening and projecting outwardly toward said rotatable device;

a piston slidably received within said cylindrical bore of said housing means, said piston including a recess of circular geometry for receiving any portion of said threaded end region of said shaft that extends into said bore when said piston is forced along said cylindrical bore to operate said rotatable device;

a plurality of thrust pins, each of said thrust pins slidably received within an individual opening of said plurality of circumferentially spaced apart openings of said endplate of said housing means;

a thrust ring, said thrust ring being substantially flat and being of annular geometry, said thrust ring being mounted to said plurality of thrust pins in concentric spaced apart relationship with said shaft of said rotatable device, the inner diameter of said thrust ring being commensurate in diameter with the outer diameter of said annular shoulder of said endplate to maintain said thrust ring in alignment with said shaft during axial displacement of said thrust ring;

a rotary fluid coupling mounted in the central portion of said closed end of said outer housing, said rotary fluid coupling for supplying fluid pressure to said cylindrical bore to

force said piston along said cylindrical bore, said piston urging said thrust pins outwardly through said circumferentially spaced apart openings of said housing means to axially displace said thrust ring along said shaft, said axial displacement of said thrust ring operating said rotatable device.

4,191,285

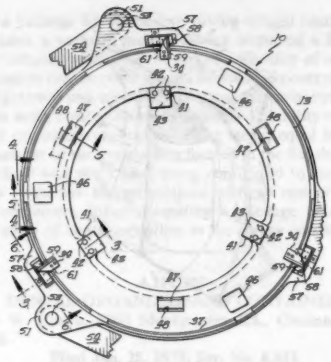
WEAR COMPENSATOR FOR BELLEVILLE SPRING CLUTCH

W. Vincent Thelander, Sr., Cave Creek, Ariz., and Terry K. Lindquist, Troy, Mich., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Sep. 6, 1977, Ser. No. 830,926

Int. Cl.² F16D *11/00, 13/75*

U.S. Cl. 192—111 A **23 Claims**



1. An automatic wear compensator for a diaphragm spring-actuated friction clutch assembly including a flywheel, a friction clutch disc, a pressure plate assembly and a clutch cover secured to said flywheel, said pressure plate assembly comprising a pressure plate operatively connected to said clutch cover, a pressure ring operatively connected to said pressure plate to rotate therewith, camming means interposed between said pressure plate and pressure ring to alter the distance therebetween, fulcrum means for the diaphragm spring on said pressure ring, and means for engaging said flywheel to sense the wear of said friction clutch disc and actuate said camming means.

4,191,286

APPARATUS FOR TRANSPORTING CYLINDRICAL STEEL ARTICLES

Katsutoshi Sato; Susumu Ito, both of Hitachi; Tadashi Kanaya, Katsuta; Hiroaki Onishi, Ibaraki; Tsuneo Ichiishi, and Akira Osaka, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

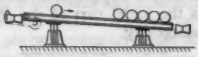
Filed Sep. 26, 1978, Ser. No. 946,019

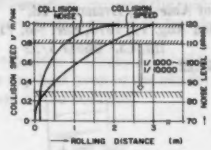
Claims priority, application Japan, Sep. 28, 1977, 52-115564

Int. Cl.² B65G *11/20*

U.S. Cl. 193—40 **8 Claims**

1. An apparatus for transporting cylindrical steel articles comprising at least one skid rail unit which comprises: an inner pole section including at least one skid rail extending longitudinally, a pair of outer pole sections each including at least one skid rail which extends longitudinally and is spaced from and substantially parallel to the skid rail of said inner pole section, the top sufaces of the skid rail of said inner pole and the skid rails of said outer pole sections defining an inclined supporting plane on which the articles to be transported roll down; at least one inner pole iron core magnetically coupled with said inner pole section; an electromagnetic coil wound around each of the inner pole iron cores; at least one outer pole iron core magnetically coupled with each of said outer pole sections; and a yoke section magnetically coupling all the inner pole iron





cores of said inner pole section and all the outer pole iron cores of said outer pole sections.

4,191,287

AUTOMATIC TRANSPORT MECHANISM AND A CARRIER MEMBER FOR USE THEREWITH

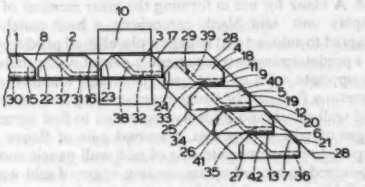
Neil R. Brook, Cambridge, and Peter J. Maling, Little Eversden, both of England, assignors to PYE (Electronic Products) Limited, Cambridge, England

Filed Oct. 13, 1978, Ser. No. 951,229

Claims priority, application United Kingdom, Oct. 18, 1977, 43302/77

Int. Cl.² B65G *35/06*

U.S. Cl. 198—472 **11 Claims**



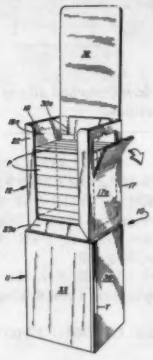
1. An automatic transport mechanism for transporting a series of carrier members through a processing zone comprising a first passageway along the floor of which substantially rectangular carrier members pass in end to end contact via the processing zone, to a second, outlet, passageway continuous with the first passageway, said second, outlet, passageway being orientated in the same plane at an angle of less than 90° to the first passageway in the direction of passage of the carrier members and having an inner and an outer wall spaced apart with a width which is wider than the first passageway by an amount which is sufficient to allow each carrier member to proceed in side to side contact with adjacent members, means for redirecting each carrier member in turn on passing from the first passageway to the second, outlet, passageway comprising at least one oblique wall surface which forms a tapered section substantially at the leading end of each carrier member for slidably engaging, when in operation, an oblique wall surface formed by at least an initial part of the outer wall of the second, outlet, passageway and characterised in that the floor of the first passageway has at least one pivot which can freely project into an open-ended inlet groove along the base of the carrier member and can be allowed to pass along the groove parallel with the longitudinal axis of the carrier member, after which passage, the or each pivot enters, into slidable engagement with a corresponding number of open-ended outlet grooves continuous with the inlet groove but each orientated at the

same angle to the inlet groove as the second, outlet, passageway is orientated to the first passageway, the or each pivot being spaced so that it contacts the second, outlet passageway at the same time as the oblique wall surface of the carrier member contacts the initial part of the oblique wall of the second outlet, passageway.

4,191,288
SHIPPER DISPLAY UNIT

Michael W. Hostad, Romeoville, Ill., assignor to Packaging Corporation of America, Evanston, Ill.

Filed Aug. 11, 1976, Ser. No. 713,514
Int. Cl.[2] B65D *5/52*
U.S. Cl. 206—45.22 **7 Claims**



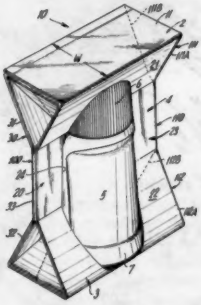
5. A blank for use in forming the inner member of a shipper display unit, said blank comprising a base panel which is adapted to subtend and engage a plurality of products disposed in a predetermined arrangement, a pair of wall panels disposed on opposite sides of said base panel and foldably connected thereto, a first pair of flange members disposed on one side of said wall panels and foldably connected to first corresponding edges of said wall panels, a second pair of flange members disposed on the opposite side of said wall panels and foldably connected to second corresponding edges of said wall panels, the folding axes of said flange members being angularly disposed relative to the axes of folding of said wall panels relative to said base panel, the combined widths of each pair of flange members measured perpendicular to the folding axes thereof with the wall panels being substantially less than the distance between the folding axes connecting said wall panels to said base panel, and locking flaps disposed on opposite sides of said base panel and foldably connected thereto, each flap being disposed intermediate the wall panels for interlockingly engaging protruding peripheral portions of a pair of said flange members when said blank is set up to form the inner member, at least one pair of flange members being provided with means for supporting an insert piece, when said blank is set up to form said inner member.

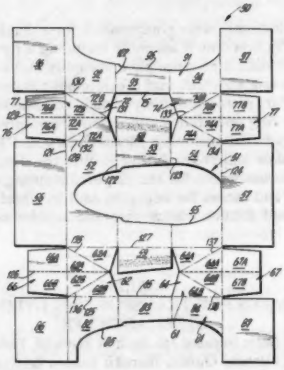
4,191,289
HOURGLASS CARTON

John J. Austin, Hinsdale, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed Jan. 2, 1979, Ser. No. 256
Int. Cl.[2] B65D *5/42, 75/00*
U.S. Cl. 206—45.14 **5 Claims**

1. A paperboard blank for forming a display carton of generally hourglass configuration, comprising: a first side panel generally rectangular in configuration said first side panel including a plurality of hingedly connected sections extending the length of said first side panel, said first side panel further including a central aperture, said central aperture conforming substantially to the configuration of the article to be contained within the carton; a pair of closure flaps each being hingedly connected to one end of said first side panel: a first end panel generally rectangular in configuration hingedly connected to one side of said first side panel, said first end panel having a pair of spaced apart pleat sections; a pair of closure flaps hingedly connected to each end of said first end panel; a second end panel hingedly connected to the other side of said first side panel, said second end panel having a pair of spaced apart pleat sections, there being a fold aperture disposed between said pleat sections; a pair of closure flaps, each of which being connected to an end of said second side panel; a pair of glue straps, each of which being hingedly connected to one side of said first side panel, each of said glue straps being disposed in one of the fold apertures of said first and second end panels; a first partial second side panel hingedly connected to said first



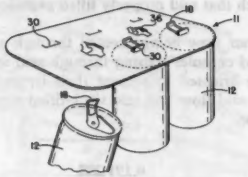


end panel, said first partial second side panel including three hingedly connected sections extending along the length of said first partial second side panel, said first partial second side panel including a generally U-shaped cut which approximates one half of the configuration of the article to be contained in the carton; a pair of closure flaps each of which being hingedly connected to one end of said first partial second side panel; a second partial second side panel hingedly connected to said second end panel, said second partial second side panel including a plurality of panel sections hingedly connected along the length of said second partial second side panel, said second partial second side panel including a generally U-shaped aperture approximating one half the configuration of the article to be contained within the carton; and a pair of closure flaps, each of which are being hingedly connected to one end of second partial second side panel.

4,191,290
TWO-WAY CONTAINER PACKAGE

Bruce C. Suffern, Streamwood, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Apr. 18, 1979, Ser. No. 31,232
Int. Cl.[2] B65D *75/00*
U.S. Cl. 206—150 6 Claims

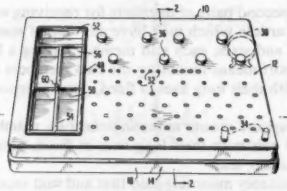


6. In a package for containers having hinged retained tear tab openers, a package making device including a flat sheet member adapted to overlie the lids of a plurality of such containers and having an outer margin substantially corresponding in configuration and dimension to the outer perimetrical margin of an array created by a predetermined plurality of closely adjacent containers, a plurality of slot means equal in number to the number of such containers formed in the flat sheet member, each of said slot means being configured to receive and retain a respective hinged retained tear tab opener on such empty containers, thereby creating a package of a closely spaced array of containers when in the empty condition.

4,191,291
DENTAL ORGANIZER AND CONTAINER

Ronald W. Brown, 8060 Montgomery Rd., Cincinnati, Ohio 45236

Filed Jan. 25, 1979, Ser. No. 6,931
Int. Cl.[2] B65D *1/36, 85/00*
U.S. Cl. 206—369 1 Claim



1. An improved multi-part plastic dental tool and equipment holder for joint and separate treatment of metallic dental burs, files, etc., having rod-like ends, and rubber dam clamps, and cotton pellets, paper points, and the like, the holder comprising:

a hollow tool-holding block having a top, side walls and end walls, the top having an upper surface;

the top having a plurality of small diameter holes formed therein at spaced positions and receiving the rod-like ends of the burs, files, etc., the holes being arranged in rows;

a series of integrally molded vertically projecting, cylindrical posts extending upwardly from the top of the block, and spaced from said holes, the posts supporting the vertically oriented rubber dam clamps in frictional grip therewith;

the block having a recess formed therein adjacent one end wall thereof and spaced from the holes and the posts, the recess being defined by end walls and side walls and having a bottom wall;

a removeable, open top partitioned tray of said thermoplastic material having a series of walls with upper edges corresponding in depth to the walls of the recess and having a bottom which seats on the bottom wall of the recess;

the tray having its wall upper edges coplaner with the upper surface of the top of the block;

the tray including a longitudinally extending vertical partition and at least one intersecting transverse partition, and an integral lift pin projecting upwardly at the intersection of said partition such that the pin is readily grasped for removal of the tray from the recess;

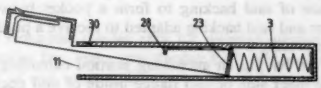
the tray being vertically removeable with its contents whereby, upon removal of the tray, the block with the metallic dental burs, files, etc., and the rubber dam clamps is submerged in a cleaning solution for cleaning thereof; and

said tray being reinserted whereby said holder and said tray are placed in a dry-heat oven or the like for high temperature sterilization of the contents.

4,191,292
CONTAINER FOR INTERCHANGEABLE TAPE CASSETTE

Eduard H. Schweizer, Heubachstrasse 41, 8810 Horgen, Switzerland

Continuation-in-part of Ser. No. 839,890, Oct. 6, 1977, abandoned. This application Jun. 22, 1978, Ser. No. 918,264
Claims priority, application Switzerland, Mar. 21, 1977, 3476/77
Int. Cl.[2] B65D *85/672*
U.S. Cl. 206—387 21 Claims



1. A container for a tape cassette comprising:

a rectangular casing having flat top wall, bottom, two parallel narrow side walls, rear wall and a front opening;

a cassette-moving push-in slide in the form of a four-sided open-bottom frame, fitting and movable inwardly and outwardly within said casing through said opening between closed and open positions, the two side parts of said frame extending along said narrow side walls of said casing and which frame at least partially surrounds the periphery of a tape cassette lying on said casing bottom;

spring means engaged between said casing and said frame which, after a holding device is unlocked, will propel said frame together with a tape cassette, which will slide therewith along said casing bottom, a certain distance through said front opening into said open position;

guide means for controlling the movement of said frame which are designed in such a way that, in said open position, at least that part of said frame which protrudes from said casing assumes an oblique position relative to said bottom of said casing so that a tape cassette which lies on said bottom of said casing and protrudes therefrom, is at least partially exposed.

4,191,293
BLISTER PACKAGE

Morris M. Newman, 79 Clifton Ave., Marblehead, Mass. 01945

Filed Aug. 9, 1978, Ser. No. 932,201
Int. Cl.[2] B65D *75/36*
U.S. Cl. 206—467 15 Claims

1. A container comprising:

a backing,

a molded blister having a receptacle and an integral circumferential flange surrounding said receptacle,

said receptacle facing a surface of said backing and said blister being demountably attached to said surface by said flange, said receptacle projecting outwardly from

said surface of said backing to form a pocket between said blister and said backing adapted to receive a product, and

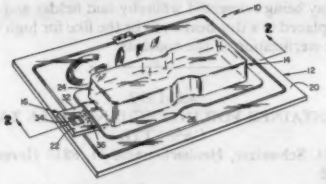
a separate spacer providing a grip,

said spacer being of lesser extent than the receptacle and having a first end portion and a second end portion,

said first end portion extending under a small portion of a wall of said receptacle and being attached to the adjacent part of said flange,

said second end portion extending away from said wall,

said spacer being added without the necessity for changing said backing or said molded blister which are normally joined without said spacer.



14. A container comprising a backing, a molded blister having a receptacle and an integral circumferential flange surrounding said receptacle,

said receptacle facing a surface of said backing and said blister being demountably attached to said surface by said flange, said receptacle projecting outwardly from said surface of said backing to form a pocket between said blister and said backing adapted to receive a product, and

a tab providing a grip,

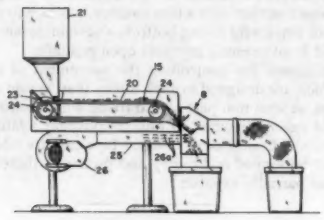
said tab having an anchoring portion extending beyond the inner side of said flange inside of said pocket, said anchoring portion having a shoulder abutting the inside of said flange.

4,191,294

EMPTY CAPSULE EJECTOR

James W. McGrath, Jr., Valley Cottage, and Paul E. Seifried, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 15, 1977, Ser. No. 860,808
Int. Cl.[2] B07B *4/02*
U.S. Cl. 209—135 **12 Claims**



1. An apparatus for separating slack-filled capsules from properly filled capsules having the same surface area comprising:

an endless conveyor belt;

means for continuously moving said belt on which is contained at least a single column of said capsules;

an inclined plane at the terminal end of said belt;

a sorting box adjacent the terminal end of said plane consisting of a series of three fins, the first fin higher than the second fin and the second fin higher than the third fin wherein the angle and separation between the first and second fin is such that the speed of motion of said capsules is reduced without jamming and the angle and separation between the second and third fin is such that only the narrowest part of said capsules fit through;

a tunnel whose terminal end is adjacent to said box;

means for creating laminar air flow through said tunnel;

a first tube aligned in about a horizontal position with said tunnel for receiving said slack-filled capsules;

a second tube aligned in about a vertical position with said box such that said properly filled capsules enter by gravity;

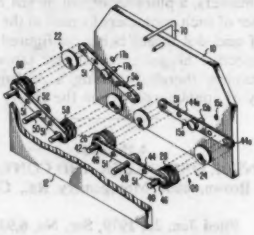
said laminar flow being created through said tunnel such that said capsules passing through said second and third fins are oriented to present their largest cross-sectional area to said flow and said slack-filled capsules enter said first tube.

4,191,295

PROCESSING RACK

Frederick J. Tams, III, Trenton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 14, 1978, Ser. No. 933,871
Int. Cl.[2] A47F *7/00*
U.S. Cl. 211—41 **10 Claims**



1. A rack comprising:

a frame;

first and second pairs of members for receiving and supporting an article which may have any one of many different shapes and sizes, each said member having a long axis;

first support means mounting the two members of said first pair with their long axes in fixed, parallel spaced relationship;

second support means mounting the two members of said second pair with their long axes in fixed, parallel spaced relationship; and

means rotatably mounting said first and said second support means to said frame so that said first pair of members is rotatable in either direction about a first axis which is parallel to and spaced from the axes of said first pair of members, and said second pair of members is rotatable in either direction about a second axis which is parallel to and spaced from said first axis and the axes of said members of said second pair, whereby when an article is placed into said rack in a position such that it bears against at least one member of each pair, it tends to cause the members of each pair to rotate about the first and second axes until they assume orientations abutting the article in which the article is stably supported.

4,191,296

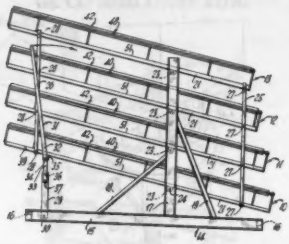
ARTICLE DISPENSING RACK

J. Robert Morgan, Palmer Hill Rd., Old Greenwich, Conn. 06870

Filed Nov. 3, 1976, Ser. No. 738,284
Int. Cl.[2] A47F *3/024*
U.S. Cl. 211—49 D **7 Claims**

1. A rack for dispensing articles comprising a base, a plurality of inclined shelves each pivotally supported by said base at

points between the ends thereof, each shelf having at least one partition to define at least two channels, said partition including fixed support means defining a line extending between the ends of said shelf and partitioning means carried on each side of



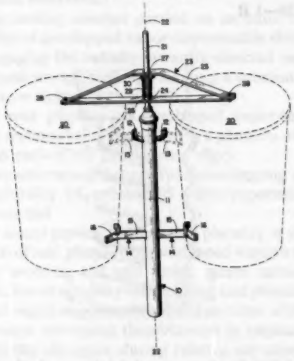
said support means, said support means being independently adjustable to fix the width of each of said channels, means at the lower or article withdrawal end of each of said shelves for retaining articles thereon which are fed toward said end by gravity and means for changing the inclination of said shelves.

4,191,297

SUPPORT AND COVER RESTRAINING DEVICE FOR REFUSE CONTAINERS

Olin A. Hardman, 5947 S. 600 W., Murray, Utah 84107

Filed Sep. 25, 1978, Ser. No. 945,235
Int. Cl.[2] A47G *29/00*
U.S. Cl. 211—83 **9 Claims**



1. A support and cover restraining device for holding refuse containers, comprising:

a. a post adapted for upright orientation and having mounting means fixed near a top section thereof for attachment of a plurality of refuse containers;

b. stabilizing means projecting from said post for retaining said refuse containers in substantial upright orientation;

c. a guide rod projecting from the top section of said post along a longitudinal axis thereof;

d. a first support arm having a central opening and means at opposing ends of said arm for attachment of covers for said refuse containers;

e. a second support arm having a central opening therein and having bowed structure in relation to said first arm, said second arm being attached at ends thereof to said first arm in orientation such that said central openings are aligned, said arms being positioned on said rod through the aligned openings and having a separation distance there-between to maintain said arms in a pivotal, radial orientation with respect to said post axis; and

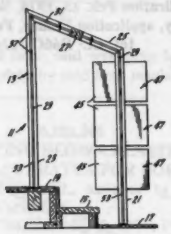
f. spring tension means coupled to and biasing said arms to a low position along said post axis corresponding to a closed position for said covers with respect to said containers, said tension means being responsive to a lifting force applied to said arms along said axis to permit upward movement of said arms to a higher position to allow rotation of said arms with attached container covers, thereby exposing openings of said containers.

4,191,298

RAILING DISPLAY RACK

Charles E. Broudy, Narberth, Pa., assignor to Hart Schaffner & Marx, Chicago, Ill.

Filed Aug. 10, 1977, Ser. No. 823,390
Int. Cl.[2] A47F *3/14*
U.S. Cl. 211—126 **4 Claims**



1. An elongated display rack for wearing apparel having a front display face and a rear display face, said rack including;

a pair of end support members, each end support member including a pair of spaced uprights, one located at the front face and the other located at the rear face of the rack, and a transversely extending rail connecting the tops of the uprights,

the top of one upright of each pair of end support members extending above the top of the other upright,

a longitudinal beam extending between said end support members and connected to the transversely extending rails of the end support members intermediate the ends thereof,

said uprights being of equal length with the bottoms of the uprights located at one face of the rack being positioned at a higher level than the bottoms of the uprights located at the other face of the rack, and

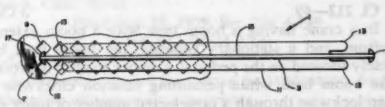
wearing apparel support means attached to the uprights and extending generally parallel to the front and rear faces of the display rack.

4,191,299

PARTITION WITH RESILIENT TONGUES FOR ENGAGING PERFORATED SHELVING

David M. Moore, Pittsburgh, Pa., assignor to Armstrong Store Fixture Corporation, Pittsburgh, Pa.

Filed Mar. 13, 1978, Ser. No. 885,667
Int. Cl.[2] A47F *5/00*
U.S. Cl. 211—184 **1 Claim**



1. A shelf partition for use with perforated shelving comprising an elongated planar body member, a flange extending along one elongated edge of said elongated planar body member in both directions normal to the plane thereof, and a pair of fasteners at opposite ends of said flange for securing said parti-

tion to the perforated shelving, each of said fasteners comprising a pair of resilient tongues extending from and integral with one end of said flange in a direction parallel to said elongated edge with one on each side of said elongated planar body member, said resilient tongues being insertable in separate perforations in said shelving where they bear against the underside of said shelving and firmly support said partition in an upright position on said shelving on said elongated edge.

4,191,300

HOISTING DEVICE FOR HIGH-POWER CRANE

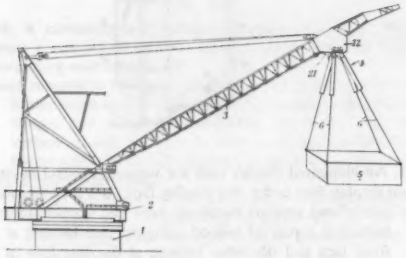
René Beghi, 13 Rue General Pershing, 78000 Versailles; Gabriel Desmars, 3 Rue de Cousson, 44000 Nantes; Yvan Monié, Chemin Rural 167, Pince Vins,92500 Rueil, and Raymond Pessayre, 105 Avenue de La Bourdonnais, 75007 Paris, all of France

Continuation of Ser. No. 658,076, Feb. 13, 1976, abandoned. This application Feb. 13, 1978, Ser. No. 877,386

Claims priority, application France, Feb. 18, 1975, 75/04982

Int. Cl.[2] B66C *1/14*

U.S. Cl. 212—41 **6 Claims**



1. A crane for hoisting and positioning a load in space, comprising a carrier base structure, a frame secured on said base structure, a control cab on said frame, a jib pivoted on said frame, a fish-plate assembly rigidly mounted at the outer end of said jib, at least three pull ropes for supporting the load, each rope having associated therewith a pair of parallel uprights suspended from said fish-plate assembly and two sets of rope traction members supported by each pair of uprights, each set of rope traction members comprising a pair of hydraulic traction cylinder and piston actuators and a jaw-type traction wedging block rigid with said pair of actuators with said rope passing therethrough, another cylinder and piston actuator for controlling the jaws of the traction block and being supported thereby, and means for controlling each one of said pair of hydraulic traction cylinder and piston actuators and each traction block control cylinder and piston actuator for pulling the rope step by step in each set of traction members.

4,191,301

ROTATION LIMITER

Charles E. Hickman, Tulsa, and William C. Denwalt, Jr., Broken Arrow, both of Okla., assignors to Auto Crane Company, Tulsa, Okla.

Filed Jun. 19, 1978, Ser. No. 916,571

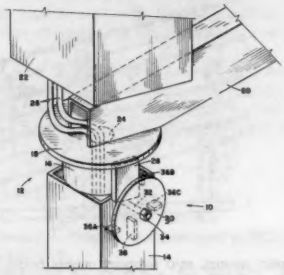
Int. Cl.[2] B66C *23/84*

U.S. Cl. 212—69 **3 Claims**

3. In a crane having a boom base with a boom extending therefrom, and a stationary pedestal, the boom base being rotatably secured on the pedestal, a device to limit the rotation of the boom base while permitting rotation clockwise and conterclockwise through a preselected number of turns, comprising:

(a) an actuating lug rigidly secured to the boom base;

(b) a disc rotatably secured to the pedestal and adjacent the boom base, the disc having a plurality of bosses secured to the disc adjacent the periphery thereof, the bosses being spaced apart from each other in angular relationship, the bosses being engaged by the actuating lug to cause angular displacement of the disc upon each rotation of the boom base; and



(c) a stop lug secured to the pedestal in the path of the disc bosses to engage therewith and arrest angular displacement of the disc and thereby the rotation of the boom.

4,191,302

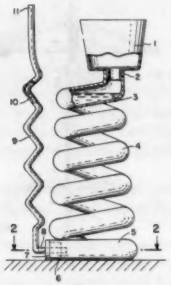
CHILD'S DRINKING CONTAINER

Christopher S. Fiducia, 181 Avenue A, Holbrook, N.Y. 11741

Continuation-in-part of Ser. No. 850,417, Nov. 10, 1977, abandoned. This application Feb. 26, 1979, Ser. No. 15,164

Int. Cl.[2] A47G *19/22*

U.S. Cl. 220—1 R **2 Claims**



1. A container for storage and drinking, which comprises:

a. a helix-shaped transparent container which directs liquid in a downward swirling movement during filling, said container comprising of a hollow tube structure, said hollow tube structure containing the liquid to be consumed;

b. a base at the bottom most end of the container said base formed from the bottom most coil of the container said bottom coil formed flat for approximately seventy-five percent of its circumference;

c. a spiral shaped transparent straw, the top of said straw extending beyond the top of the container so as to keep the fluid in the container from coming out of the top of the straw due to gravity, the straw formed to permit liquid from the container to be received by the straw in an upward swirling movement during the filling of the container and during drinking giving a fascinating visual effect; and

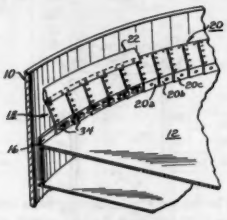
d. a stopper to connect the straw to the container and to communicate the liquid from the container to the straw.

4,191,303

LIQUID STORAGE TANK SEALING SYSTEM

Mark D. Kinghorn, Sr., P.O. Box 1333, Rte. 30, Schererville, Ind. 46375, and Mark D. Kinghorn, Jr., 11903 W. 90th, St. John, Ind. 46373

Filed Mar. 9, 1979, Ser. No. 19,080
Int. Cl.[2] B65D *87/207, 87/20*
U.S. Cl. 220—222 20 Claims



1. A sealing system for sealing the space between a liquid storage tank shell and the tank roof freely floating on the liquid stored within the tank shell, the sealing system comprising

a plurality of overlapped vapor-impermeable shield sections extending radially outwardly from the perimeter of a floating roof of a liquid storage tank for engaging a radially inwardly directed inner wall of the liquid storage tank to form a substantially liquid and vapor tight seal therewith,

said plurality of overlapped vapor-impermeable shield sections having an inner end carried by the roof of the liquid storage tank and forming a substantially liquid and vapor tight seal therewith,

a flexible sealing member carried on an outer end of said plurality of overlapped vapor-impermeable shield sections for engaging the radially inwardly directed inner wall of the liquid storage tank and forming a substantially liquid and vapor tight seal therewith,

each of said plurality of overlapped vapor-impermeable shield sections being formed with a plurality of slots adjacent to each of the overlapping edges,

gasket means carried between the overlapping portions of said plurality of overlapped vapor-impermeable shield sections, and

fastener means passing through said plurality of slots formed in each of said plurality of overlapped vapor-impermeable shield sections, and said gasket means carried therebetween, for structurally interlocking said plurality of overlapped vapor-impermeable shield sections while allowing transverse movement therebetween in response to variation in the rim space during relative movement between the floating roof and the inner wall of the liquid storage tank and forming a substantially liquid and vapor tight seal between said overlapping edges.

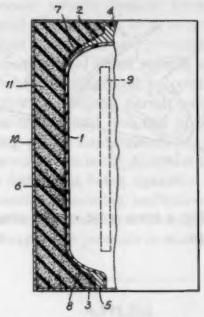
4,191,304

PRESSURE TANK FOR HOT-WATER HEATERS

Heinz Schiedat, Hoxter, Fed. Rep. of Germany, assignor to Stiebel Eltron GmbH & Co. KG, Holzminden1, Fed. Rep. of Germany

Continuation of Ser. No. 766,495, Feb. 7, 1977, Pat. No. 4,099,641. This application Feb. 22, 1978, Ser. No. 880,695
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1976, 2605103; Dec. 2, 1976, 2654585
Int. Cl.[2] B65D *25/18*
U.S. Cl. 220—414 1 Claim

1. A pressure tank, particularly for hot water heaters, comprising: a synthetic liner; a continuous glass fiber wrapping free of synthetic resin for reinforcing said liner and in direct contact with said liner; an outer container shell spaced from said wrapping: and a synthetic foamed, heat-insulating layer between said wrapping and said shell and around said wrapping holding



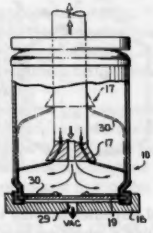
said wrapping to said liner, said wrapping being held against said liner and itself solely by said heat insulating means.

4,191,305

CONTAINER HAVING BLOWN PLASTIC LINER AND METHOD AND APPARATUS FOR FORMING SAME

Glenn L. Davis, Chicago, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Division of Ser. No. 794,993, May 9, 1977, Pat. No. 4,127,430. This application Jun. 22, 1978, Ser. No. 918,301
Int. Cl.[2] B65D *25/14*
U.S. Cl. 220—462 1 Claim



1. A lined container, said lined container comprising a container including an end wall and a body, and a tubular lining, said lining being bonded to said end wall about a preselected exposed area of said end wall and extending across said end wall in stretched relation to said body, and said liner is in an expanded state above said end wall and confirming to said body, said lining having a terminal annular end portion forming that part of said lining bonded to said container end wall about said preselected exposed area of said end wall.

4,191,306

STAMP DISPENSER

Walter P. Rabner, 13861 Fresh Meadow, Apartment 1-H, Seal Beach, Calif. 90740

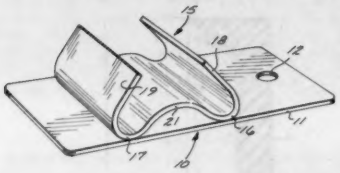
Filed Jan. 19, 1979, Ser. No. 4,749
Int. Cl.[2] B65H *1/00*
U.S. Cl. 221—33 3 Claims

1. A dispensing device for storing postage stamps folded in an accordian arrangement, comprising:

a first rectangular strip provided with an opening proximate one end thereof; and

a second rectangular strip attached to said first strip and bent to form two end segments inclined towards each other to

form a gap therebetween and convolved to include a central arc directed towards said gap, said arc and end



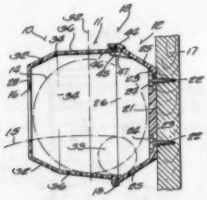
segments defining a transverse cavity conformed to receive said stamps.

4,191,307

DISPENSER FOR PLASTIC BAGS

Robert A. LeCaire, Jr., Appleton, and Barry B. Glashagel, Larsen, both of Wis., assignors to Presto Products Incorporated, Appleton, Wis.

Filed Mar. 24, 1980, Ser. No. 889,709
Int. Cl.[2] B65D *85/672*
U.S. Cl. 221—45 **8 Claims**



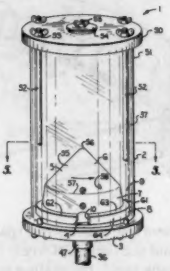
1. A sheet material dispenser adapted to be mounted on an upright wall and having a mounting base section and a cover section, a hinge interconnecting said sections so that the cover section may be swung away from the base section to load sheet material thereinto, latch means for latching the two sections together when the cover section is swung closed, said cover section being supported by the base section in cantilevered relation to said upright wall to impose the weight of the loaded dispenser and pressures developed by dispensing sheet material from the dispenser on the base section, said sections comprising plastic material which is yieldable under stress, said base section having a flat base panel adapted to be fastened to the upright wall and side and end panels extending at obtuse angles from the base panel and intersecting one another to form angled corners and to constitute the base section as a truncated pyramid enclosing a hollow space and having inherently strong beam configurations to withstand the pressures exerted thereon without sufficient change of shape to release the latch means when the dispenser is mounted, loaded and is use, said side panels having edges spaced from the base panel, said hinge being disposed on the edge of one side panel and the latch means being disposed on the edge of the other side panel whereby to space the hinge and latch means from said upright wall, said latch means comprising two snap latches proximate the corners formed by the intersecting side and end panels of the base section.

4,191,308

TABLET DISPENSER FOR FUMIGATING AGRICULTURAL COMMODITIES

James R. Allen, Salina, and Alvin T. Hammes, Shawnee Mission, both of Kans., assignors to Research Products Company, Salina, Kans.

Filed Sep. 15, 1978, Ser. No. 942,647
Int. Cl.[2] B65H *3/60*
U.S. Cl. 221—202 **12 Claims**



1. A tablet dispenser for fumigating agricultural commodities, comprising:

(a) a container shaped for retaining a plurality of pesticide tablets therein; said container having a sidewall, and a base with an aperture therein proportioned to permit the tablets to pass therethrough;

(b) a dispensing rotor mounted in said container base for rotation therein, and including:

(1) a first portion having an outer surface thereof spaced apart from said container sidewall and forming an annularly shaped channel therebetween; said channel being shaped to receive therein a single file ring of the tablets, oriented on a circumferential edge thereof;

(2) a second portion depending from and extending outwardly of said first portion, forming a base surface of said channel on which the tablets are supported, and including a dispensing aperture shaped to permit the tablets to pass therethrough; said rotor dispensing aperture being positioned radially coextensive with said container base aperture for selective alignment therewith;

(c) means urging the tablets in the container into said channel;

(d) means rotating said rotor with respect to said container, whereby a tablet is dispensed from said tablet dispenser for each alignment of said base and rotor apertures;

(e) a retaining pin connected with said container, extending into said channel and adapted to abut tablets disposed in the channel and retain the same in a generally stationary state with respect to said dispensing rotor, whereby the tablets in the channel quickly fill the rotor dispensing aperture for dependable dispensing of the tablets.

4,191,309

PRODUCT PORTIONING IN THE CONTINUOUS PUMPING OF PLASTIC MATERIALS

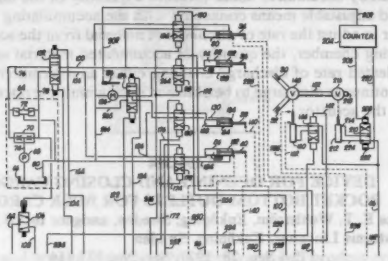
Lewis F. Alley, Kansas City, Mo., and James E. White, Overland Park, Kans., assignors to Marlen Research Corporation, Overland Park, Kans.

Filed Nov. 23, 1977, Ser. No. 854,355
Int. Cl.[2] B67D *5/22*; G01F *11/16*
U.S. Cl. 222—1 **6 Claims**

1. In a method of portioning viscous products dispensed as a result of movement of a pumping member by fluid on one side thereof, the improvement which comprises the steps of:

displacing fluid with said member from the opposite side

thereof simultaneously with said movement and at a predetermined relationship to the volume of product being dispensed;



sensing when a certain selected volume of fluid, corresponding to the desired portion of product to be obtained, has been displaced from said opposite side of the member; and in response to said sensing step, temporarily interrupting further dispensing of the product.

4,191,310

DEVICE FOR INFLATING LIFESAVING EQUIPMENT

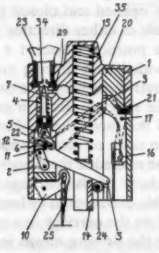
Jost Bernhardt, Hamburg; Georg Hase; Peter Hase, both of Wedel, and Klaus Hagen, Hamburg, all of Fed. Rep. of Germany, assignors to Bernhardt Apparatebau GmbH & Co., Hamburg, Fed. Rep. of Germany

Filed Apr. 5, 1978, Ser. No. 893,260

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1977, 771077[U]

Int. Cl.[2] B67B *7/24*; F17C *00/00*

U.S. Cl. 222—5 **9 Claims**



1. A device for inflating the floating body of lifesaving equipment, which includes: a housing comprising passage means for connection to a body to be inflated, said housing also being provided with connecting means for connecting to said housing a pressure container adapted to store and furnish a gas under pressure, and provided with a diaphram normally closing off said pressure container, a striker reciprocably mounted in said housing and operable to pierce said diaphragm of a pressure container connected to said housing for establishing communication between said passage means and the interior of the pressure container connected to said housing, a manually operable lever operatively connected to said striker and operable to actuate said striker for causing the latter to pierce said diaphragm of a container connected to said housing, pivotable lever means pivotally journalled in said housing and having one end designed as free end and having its other end operatively connected to said striker, said free end being pivotable from an ineffective position in which said pivotable lever does not cause said striker to pierce a diaphragm of a pressure container connected to said housing toward an effective position to cause said striker to pierce said last mentioned diaphragm, a two-arm control lever pivotally arranged within said housing and having a first arm normally engaging said free end so as to hold the same in its ineffective position, said control lever also having a second arm, an abutment member comprising a water soluble section normally abutting said second arm of said control lever so as to prevent said first arm from releasing said free end of said pivotable lever means from its ineffective position, said water soluble section of said abutment member when disintegrated by contact with water becoming ineffective to thereby permit said first arm of said control lever to release said free end of said pivotable lever means and spring means continuously urging the free end of said pivotable lever means in the direction toward the effective position of the latter and being operable in response to said water soluble section becoming ineffective to move said free end toward its effective position to thereby cause said striker to pierce the diaphragm of a pressure container connected to said housing.

4,191,311

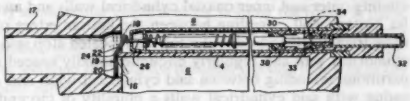
TWO COMPARTMENT CONTAINER HAVING PUSH BUTTON ACTUATOR ROD

Giuseppe Auguadro, Via G. della Porta, 17, Como, Italy

Continuation-in-part of Ser. No. 757,289, Jan. 6, 1977, abandoned. This application May 11, 1978, Ser. No. 904,954

Int. Cl.[2] A47G *19/24*

U.S. Cl. 222—142.6 **6 Claims**



1. A dispensing container comprising,

a first compartment having a first outlet opening in an upper portion thereof to permit material in said first compartment to flow through said first outlet opening upon inversion of the container,

a second compartment having a second outlet opening in an upper portion thereof, to permit material in said second compartment to flow through said second outlet opening upon inversion of the container, said second outlet opening being adjacent to said first outlet opening,

a movable closure member,

pivot means supporting said closure member for pivotal movement between a first position and a second position,

said closure member including a first closure portion in said first outlet opening, said first closure portion occupying a closed position where it obstructs said first outlet opening when the closure member is in its first position and occupying an open position where said first outlet opening is open when the closure member is in its second position,

said closure member also including a second closure portion in said second outlet opening, said second closure portion occupying a closed position where it obstructs said second outlet opening when the closure member is in its second position and occupying an open position where said second outlet opening is open when the closure member is in its first position,

actuator means for moving said closure member from its first position to its second position, said actuator means including a rod connected to said closure member at a point spaced from said pivot axis, said rod being axially movable from a retracted position which it occupies when said closure member is in said first position to an extended position which it occupies when said closure member is in said second position, said actuator means also including a manually operated pushbutton and means for holding said rod at its extended position and then at its retracted position in response to successive manual depressions of said pushbutton.

4,191,312
MULTICOMPARTMENT CONDIMENT AND SPICE DISPENSER

Sami Shemtov, 1228 E. 73rd St., Brooklyn, N.Y. 11228

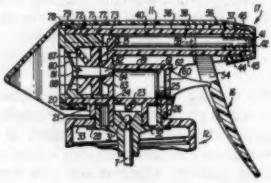
Filed May 15, 1978, Ser. No. 905,736
Int. Cl.[2] A47G *19/12*
U.S. Cl. 222—142.9 9 Claims

1. A device selectively dispensing a plurality of particulate materials comprising an integrally formed body member including outer and inner coaxial cylindrical walls and an annular bottom wall extending between the bottom edges of said cylindrical walls and a circular top wall located atop said inner cylindrical wall and regularly circumferentially spaced radial partitions extending between said cylindrical walls and delineating with said cylindrical walls a plurality of circumferentially spaced vertical compartments provided with top openings, a vertical pin coaxially upwardly projecting from said top wall, a cover member rotatably mounted in said body member and having a central opening coaxially registering with said pin and including a perforate section of an area not exceeding the transverse cross sectional area of one of said compartments at the top thereof, said cover member being rotatable to transfer said perforate section into selective registration with respective compartment top openings and first locking means releasably locking said cover member to said body member for rotation relative thereto.

4,191,313
TRIGGER OPERATED DISPENSER WITH MEANS FOR OBTAINING CONTINUOUS OR INTERMITTENT DISCHARGE

William S. Blake, Miami Lakes, and Roy Hammett, Miami, both of Fla., assignors to James D. Pauls and J. Claybrook Lewis and Associates, Limited, Miami, Fla.

Filed Jul. 24, 1978, Ser. No. 927,566
Int. Cl.[2] B05B *11/02*
U.S. Cl. 222—335 17 Claims



1. A dispenser, comprising: a body having a plurality of expansible chambers therein, including a pump chamber and an accumulating chamber; a manually operated actuator accessible exteriorly of the dispenser and having means connected with the pump chamber to alternately enlarge and reduce the volume of the pump chamber when the actuator is operated; said accumulating chamber having a resiliently yieldable means whereby the accumulating chamber volume is enlarged when material is moved thereinto by the pump chamber, to thereby accumulate under pressure a quantity of the material; and adjustable means connected with the accumulating chamber to adjust the rate of discharge of material from the accumulating chamber, the quantity of accumulated material and the selected rate of discharge enabling either an intermittent or a continuous discharge to be obtained during multiple operations of the actuator.

4,191,314
DEVICE FOR OPENING AND CLOSING CARGO POCKET BOTTOM OUTLETS FOR BULK CARGO

Åke E. T. Wahlström, Enköping, Sweden, assignor to AB Nordstroms Linbanor, Enköping, Sweden

Filed Sep. 28, 1977, Ser. No. 837,414
Claims priority, application Sweden, Oct. 4, 1976, 7610984
Int. Cl.[2] B63B *27/04*
U.S. Cl. 222—506 11 Claims

7. Apparatus for opening and closing bottom outlets of a plurality of cargo pockets which are arranged in rows and beneath which conveyors are arranged, said apparatus comprising a guide arrangement extending longitudinally along the bottom of a row of pockets and carrying covers for the bottom outlets of the pockets, means mounting said covers for horizontal movement in the longitudinal direction of the guide arrangement between opened and closed positions, and at least one carriage movable in either direction parallel to said guide arrangement into a position adjacent a selected cover, said carriage being provided with driving means which are movable from an inoperative position to a position in which they are engaged with the selected cover in order to, during subsequent movement of the carriage in either direction, move the selected cover to an open or closed position, after which the driving means can be moved to the inoperable position in order to allow the movement of the carriage to another cover, a raisable and lowerable outlet spout or loading box horizontally movably journalled on the carriage in a manner such that said spout or box, when the driving means is moved into engagement with a cover, is raisable to an abutment position beneath the cover, said apparatus further including locking means engaging with stationary stops so that the spout or box is fixed below the outlet of the pocket during subsequent movement of the carriage and displacement of the cover.

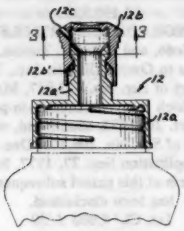
4,191,315
CLOSURE

Ludwig F. Funke, 7200 Newburgh Rd., Evansville, Ind. 47715

Continuation of Ser. No. 774,132, Mar. 3, 1977, abandoned. This application Sep. 25, 1978, Ser. No. 945,108
Int. Cl.[2] B67D *3/00*
U.S. Cl. 222—553 3 Claims

1. A closure for a product container comprising a body member receiving a cap on a dispensing passageway, where said cap slides linearly on said body member to and from a pouring position and a non-pouring position and is freely rotatable thereon at said pouring position to automatically achieve pouring in any direction without the necessity of alignment, said cap having an upper surface blending into an outwardly flaring rim lower than said upper surface and including a downwardly depending side wall, and an outlet in said cap positioned in said outwardly flaring rim thereof proximate the

juncture with said downwardly depending side wall selectively communicating with the contents of said product con-



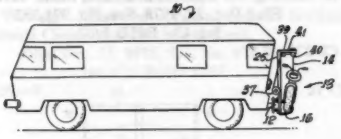
tainer and serving a dripless function when said product container is returned to a normal non-pouring position.

4,191,316

MOTORCYCLE CARRIER

Paul A. Baumgartner, 8906 Mills Ave., Whittier, Calif. 90605

Filed Jan. 8, 1979, Ser. No. 1,885
Int. Cl.[2] B60R *9/00*
U.S. Cl. 224—42.03 B **5 Claims**



1. A motorcycle carrier for use on the bumper of a vehicle, said carrier comprising:

a frame member including means for attachment to the bumper of a vehicle;

first and second upright members affixed to said frame member, and extending upwardly a height in excess of the height of the motorcycle to be carried, and separated horizontally a distance less than the length of the motorcycle to be carried, each of said upright members having a generally horizontal arm affixed to the upper end thereof;

bearing means comprising a first bearing means affixed to said first upright member and a second bearing means affixed to said second upright member at a point near said frame member;

shaft means held by each of said bearing means to permit the rotation of said shaft;

first and second cable means affixed to said shaft and passing upwardly from said shaft means to pulley means held on said arms affixed to said first and second upright members;

hook means attached to the extremity of both of said cable means for attachment to two points on the upper extremity of the motorcycle to be carried so that said motorcycle is hung from said cables;

handle means affixed to said shaft to facilitate the rotation thereof;

ratchet means affixed to said shaft to prevent the unwinding of said cable after the cable has been wrapped about the shaft and a load is exerted on said cable; and

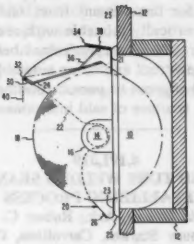
means to affix the lower portion of said motorcycle to said bumper.

4,191,317

TOILET PAPER UNROLLING FIXTURE

Lane J. Harkins, P.O. Box 149, Berthoud, Colo. 80513

Filed May 12, 1978, Ser. No. 905,190
Int. Cl.[2] B65H *35/10*; A47K *10/22*; B26F *3/02*
U.S. Cl. 225—77 **1 Claim**



1. In a conventional built-in recessed toilet paper holder of the type that includes a housing having a pair of spaced apart side brackets between which a spindle is suspended for rotatably supporting a roll of toilet paper for the convenience of the user, the improvement comprising:

a frame having a pair of like vertically positioned side members, each of said pair of side members including a generally semicircular notch area for holding the frame in place behind the spindle, the side members being spaced apart a distance greater than the width of the roll of toilet paper, but less than the distance between the side brackets of the toilet paper holder;

a generally flat paper guide spaced above the roll of toilet paper and fixedly positioned between the side members and over which the free end of the roll of toilet paper extends as paper is reeled off the roll;

a tensioning flap, a first edge of which is spaced above said paper guide and hingedly attached between the side members, said tensioning flap having a second edge that engages the free end of the roll of toilet paper that extends over the paper guide; and

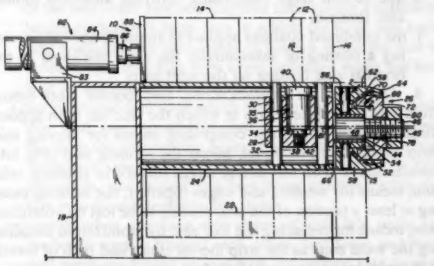
a tear bar positioned between the side members proximate to a forward edge of the paper guide for enabling the user to tear a desired length of paper from the free end of the roll of toilet paper.

4,191,318

BREAKAWAY UNCOILER

John W. Rogers, 22175 Douglas Rd., Shaker Heights, Ohio 44122

Filed Dec. 22, 1978, Ser. No. 972,552
Int. Cl.[2] B26F *3/00*
U.S. Cl. 225—103 **12 Claims**



1. Apparatus for detaching and dispensing sheet metal strip material from a construct having an axial opening therethrough and including a plurality of axially spaced coils of strip

material interconnected by frangible connections, said apparatus comprising:

(a) a frame;

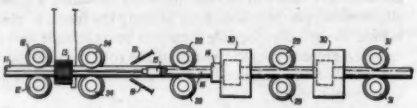
(b) a construct support attached at one end to said frame, said support being adapted to telescopically receive said construct through the axial opening therein;

(c) means at the free end of said support for engaging a selected coil for detachment from said consturct, said means being vertically movable with respect to said support to fracture the interconnections between a selected coil and the construct and being rotatably mounted with respect to said support to permit rotation of the engaged coil following fracture of said interconnections.

4,191,319
GALVANIZED TUBE WELDED SEAM REPAIR METALLIZING PROCESS

J. Charles Headrick, Oceola, Ark.; Robert C. Peel, Ranburne, Ala., and R. Emory Starnes, Carrollton, Ga., assignors to Southwire Company, Carrollton, Ga.

Continuation-in-part of Ser. No. 667,066, Mar. 15, 1976, Pat. No. 4,082,212. This application Mar. 30, 1978, Ser. No. 891,892
The portion of the term of this patent subsequent to Apr. 4, 1995, has been disclaimed.
Int. Cl.² B23K *31/06*
U.S. Cl. 228—147 **5 Claims**



1. An improved method of manufacturing zinc coated steel tubing from zinc coated steel strip of the type in which the zinc has been applied directly to the steel strip before continuously passing said zinc coated steel strip along a path and sequentially performing thereon the following steps:

a. forming said strip into tubular form and bringing the edges thereof into abutting relation,

b. welding the edges together and thereby volatilizing zinc from the weld area,

c. restoring the zinc coating to the weld area by spray atomization metallizing that area in two sequential stages,

wherein the improvement comprises:

d. the first stage comprising sensing the temperature of said tubular form, moving an atomization metallizing means along the path of the strip in response to said temperature, spraying atomized molten aluminum alloy containing from more than about 0.45 to about 0.95 weight percent iron, no more than 0.10 weight percent silicon, and the remainder aluminum with associated trace elements,

e. the second stage comprising spraying atomized molten zinc thereon,

f. the combined coatings applied in steps (d) and (e) providing a coating of substantially the same thickness as the original zinc coating on the steel strip.

4. Apparatus for manufacturing zinc coated steel tubing from zinc coated steel strip in which the zinc has been applied directly to the steel strip, comprising means for moving said strip along a path of travel, means for forming said strip into tubular shape with the lateral edges thereof in abutting relation, means for welding said edges together, the welding causing at least a portion of the zinc coating to be lost by volatilization, means for replacing the lost zinc by atomization metallizing the weld zone as the strip moves along said path of travel, said replacing means including first spray means for atomization metallizing the weld zone with an aluminum alloy coating, and second spray means for atomization metallizing the aluminum alloy coated weld zone with a zinc alloy coating, and wherein said first spray means and second spray means includes means for sensing the temperature of said strip.

4,191,320
DEGRADABLE ARTICLE

Lynn J. Taylor, Toledo, and John W. Tobias, Perrysburg, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

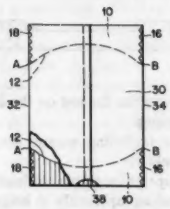
Continuation-in-part of Ser. No. 472,947, May 24, 1974, Pat. No. 4,056,665, which is a continuation-in-part of Ser. No. 301,199, Oct. 26, 1972, abandoned, which is a continuation-in-part of Ser. No. 206,144, Dec. 8, 1971, Pat. No. 3,797,690. This application Sep. 27, 1977, Ser. No. 836,944
The portion of the term of this patent subsequent to Nov. 1, 1994, has been disclaimed.
Int. Cl.² C08J *3/20*
U.S. Cl. 229—3.5 R **16 Claims**

1. As an article of manufacture, a photodegradable polymeric container package comprised of at least one thermoplastic organic polymer and at least two aromatic carbonyl photosensitizers present in amounts sufficient to accelerate the photodegradation of the resulting polymeric composition, at least one aromatic carbonyl photosensitizer having an ultraviolet absorption maximum in the range of 280 to 330 millimicrons and at least one other aromatic carbonyl photosensitizer having an ultraviolet absorption maximum in the range of 330 to 400 millimicrons.

4,191,321
CONTAINER HAVING PAPER-BOARD END CAP AND OVAL SLEEVE

Rolf A. Samsing, 349 Elm St., Braintree, Mass. 02184

Filed Dec. 29, 1978, Ser. No. 974,352
Int. Cl.² B65D *5/02*
U.S. Cl. 229—5.5 **6 Claims**



1. An improved container having an oval cross-sectional shape, comprising: a tubular central section; an end cap inserted into an end of said tubular central section; said end cap being formed from a rectangular sheet material having an oval shaped crease symmetrical about an axis of the rectangle, folded along the crease such that portions of the rectangular sheet material outside said oval shaped crease frictionally engage said tubular central section; thereby forming a container having an oval cross-sectional shape.

4,191,322
PLEATED CLOSURE CONSTRUCTION

Alfred W. Kinney, Kenneth City, Fla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

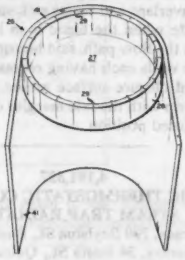
Division of Ser. No. 630,577, Nov. 10, 1975, Pat. No. 4,084,488. This application Jan. 30, 1978, Ser. No. 873,648
Int. Cl.² B65D *3/12*
U.S. Cl. 229—5.8 **4 Claims**

1. A paperboard closure formed from a single discoidal blank, said closure comprising:

a discoidal central surface, and

an annular flange depending from the perimeter of said central surface, said flange having a plurality of spaced pleats protruding inwardly from the inside surface thereof

and extending generally perpendicular to the perimeter of said flange, each of said pleats extending from the outer perimeter of said flange and terminating at a point spaced from said discoidal central surface, the outside surface of said flange being substantially smooth and continuous,



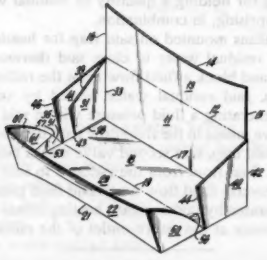
with substantially the only irregularities in the otherwise smooth outside surface of the flange being hairlines each of which coincides with the location of a respective one of said pleats on the inner surface of said flange, when said flange is in the position which it will assume when mating with a corresponding sidewall surface.

4,191,323

CARTON BLANK AND ERECTED INTEGRAL CARTON AND COVER

George P. Webinger, Minneapolis, Minn., assignor to Champion International Corporation, Stamford, Conn.

Filed Dec. 22, 1978, Ser. No. 972,271
Int. Cl.² B65D *3/02*
U.S. Cl. 229—8 **21 Claims**



1. A carton blank comprising as integral portions of a paperboard blank:

(a) a base rectangular panel (11) having opposite fold line edges with dimensions in length of L_1 (12,17) and width of W_1 (32,33);

(b) a first pair of side flap panels (30,31) each first side flap panel being joined at a fold line (32,33) to an opposite width side of said base panel (11);

(c) a rectangular panel (18) joined to the base panel (11) along a fold line (17) and having opposite fold line edges with length L_2 (17,19) equal to length L_1 and with width W_2 (42,43);

(d) a second air of flap panels (40,41) each second flap panel being joined at a fold line (42,43) to an opposite width side of said rectangular panel (18);

(e) a concave edge four-sided panel (13) having its inner edge (12) joined at a fold line to said base panel (11) along its length and having an opposite free edge (14) in the form of a concave curve;

(f) a convex top four-sided panel (20) having its inner edge (19) joined at a fold line to the said rectangular panel (20) along its length and having an opposite non-free edge (21) which is a convex curve;

(g) a third pair of side flap panels (50,51) with each of said third pair of side flap panels being joined at a fold line (52,53) to an opposite side of said convex top panel (20);

(h) a concave four-sided front panel (22) having a concave curved edge (21) which is the said convex curved edge of said convex top panel; and

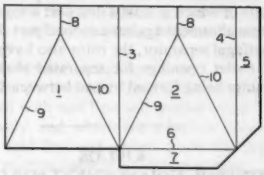
(i) a fourth pair of side flap panels (60,61) with each side flap panel being joined at a fold line (62,63) to an opposite width side of said concave front panel (22).

4,191,324

COLLAPSIBLE BOX

Yoshiko Kitagawa, 23-1, Yoyogi 2-chome, Shibuya-ku, Tokyo, Japan

Filed Aug. 25, 1978, Ser. No. 936,805
Claims priority, application Japan, Aug. 27, 1977, 52-115217[U]; Sep. 8, 1977, 52-120763[U]
Int. Cl.² B65D *5/36*
U.S. Cl. 229—22 **19 Claims**



1. A collapsible box which alternately takes a substantially flat state for storage or an erected state for receiving contents, and which is easily erected from the flat state, comprising:

a substantially rectangular front side wall and a substantially rectangular back side wall which are foldably connected to each other along the bottom and both sides thereof to form a collapsed, substantially flat structure;

first fold lines which are lengthwise scored from the center of the top edge of each of the two side walls and extending toward the bottom edges of each of the two side walls, said first fold lines terminating short of said bottom edges of the side walls and said first fold lines having a sufficient length such that a large area in which the front and back side walls contact each other is formed when the box is erected, said first fold lines being unfolded when the box is in its substantially flat state; and

a pair of second fold lines which are slopwise scored on each side wall, said second fold lines of each side wall extending from the terminating point of said first fold line of the respective side wall to respective bottom corners of said side walls, said second fold lines being unfolded when the box is in its substantially flat state;

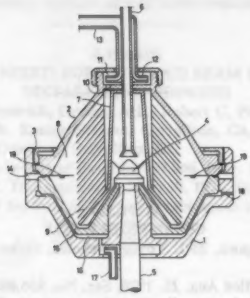
whereby when opposing side edges of said side walls are pushed inwardly toward each other, said front and back said walls are folded on said first and second fold lines to form an erected box, a large area of said side walls contacting each other to close the top of the erected box and said first fold lines forming side edges of the erected box at the top portion of the erected box.

4,191,325

CENTRIFUGE WITH SLUDGE OUTLETS AT ROTOR PERIPHERY

Klaus Stroucken, Ronninge; Torbjorn Winberg, Stockholm, and Kaj Lindfors, Tumba, all of Sweden, assignors to Alfa-Laval AB, Tumba, Sweden

Filed Aug. 9, 1978, Ser. No. 932,380
Claims priority, application Sweden, Aug. 12, 1977, 7709131; Mar. 14, 1978, 7802889
Int. Cl.[2] B04B *1/12*
U.S. Cl. 233—20 A 17 Claims



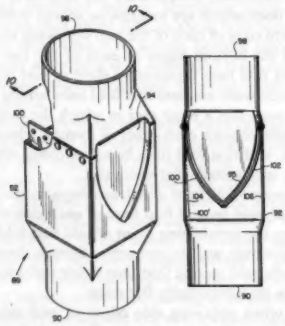
1. In a centrifugal separator, a rotor mounted for rotation about an axis and having a central inlet for a sludge-containing liquid and a central outlet for separated liquid, the rotor including two parts of which at least a first part is axially displaceable into and from abutment against a second part during operation of the centrifugal separator, the rotor also having a plurality of peripheral outlet openings for separated sludge, said sludge outlet openings being formed by and between said two parts of the rotor.

4,191,326

DRAFT CONTROL ARRANGEMENT FOR COMBUSTION APPARATUS

Werner Diermayer, 1275 Panorama Dr., Lafayette, Calif. 94549, and Luitpold Kutzner, Marschnerstrasse 78, D-8000 Munich, Fed. Rep. of Germany

Division of Ser. No. 884,209, Mar. 7, 1978, Pat. No. 4,159,078. This application Dec. 20, 1978, Ser. No. 971,518
Int. Cl.[2] G05D *23/08*
U.S. Cl. 236—1 G 5 Claims



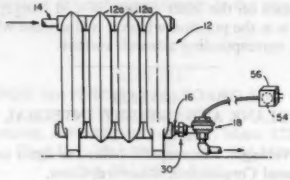
1. A damper for controlling the flow of vent gases from a gas-fired heating apparatus, including the combination of a housing enclosing a portion of the flow path of vent gases from the heating apparatus, temperature responsive means mounted within the housing for movement across the path between open and closed positions responsive to the temperature of vent gases, said temperature responsive means when in its open position being oriented in streamlined relationship along the path to present a minimum of resistance to the flow of gases, the temperature responsive means including at least one bimetal blade, and the housing includes means having a closure surface which overlaps and forms a closure with the side margins of the blade when the blade is in its closed position to essentially close the flow path, said housing further including a pair of opposite walls each having recesses having inner sides which form said closure surface means with the inner sides shaped to conform with the side margins of the blade when the blade is in its closed position.

4,191,327

AUTOMATIC THERMOSTATIC CONTROL FOR A STEAM TRAP RADIATOR

Arthur H. Anderson, 790 Boylston St., Boston, Mass. 02199, and Thomas E. Murray, 34 South St., Quincy, Mass. 02169

Filed Nov. 10, 1977, Ser. No. 850,152
Int. Cl.[2] F24F *11/00*
U.S. Cl. 236—42 7 Claims



1. A control system for a steam radiator having an inlet and an outlet and having a steam trap with a thermostatic valve member in fluid communication with the outlet, said trap having means for holding a quantity of residual water within the trap, comprising, in combination,

auxiliary means mounted on said trap for heating said trap and said residual water to close said thermostatic valve member and block a fluid flow from the radiator through said trap, said residual water heated by said auxiliary means generating a fluid pressure within said trap, and

second valve means in the fluid flow path between the radiator and said trap, said second valve means being operable to pass a fluid flow from the radiator to said trap and to block a reverse fluid flow when said fluid pressure in said trap generated by said auxiliary heating means exceeds the fluid pressure at the return outlet of the radiator.

4,191,328

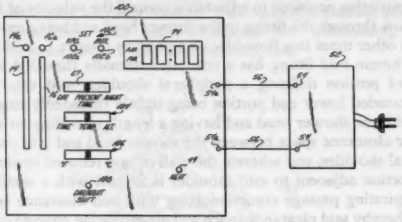
INTEGRAL THERMOSTAT-DIGITAL CLOCK UNIT

Roger H. Isaacs, Staten Island; David Sandelman, and Daniel E. Shprecher, both of Brooklyn, all of N.Y., assignors to Rapid-circuit Corp., Brooklyn, N.Y.

Filed Sep. 1, 1977, Ser. No. 829,904
Int. Cl.[2] F23N *5/20*; G05D *23/00*
U.S. Cl. 236—46 R 12 Claims

1. A room unit thermostat connected by only two wires with a remotely controlled circuit for controlling the supply of warm or cold air to alter the ambient temperature in said room, said room unit comprising display means to display the time of day and the ambient temperature, clock means to generate said time of day connected to said display means, and power means connected to said two wires for supplying timing signals and power to said clock means and power to said thermostat, said thermostat supplying a control signal on said two wires for controlling said remotely controlled circuit, further comprising daytime temperature control means and nighttime temperature control means, logic means connected to said clock means and comprising means to enable said daytime control or

said nighttime control, said logic means being settable to nighttime and daytime settings and comprising means responsive to



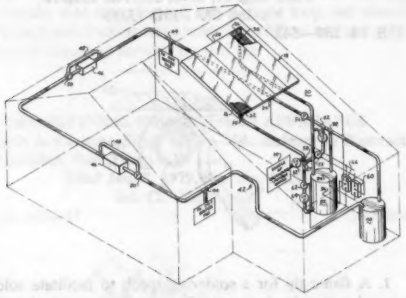
the time of day being equal to said settings so enabling said respective daytime and nighttime control means.

4,191,329

SINGLE-PIPE HOT WATER SOLAR SYSTEM

William E. Geaslin, Lubbock, Tex., assignor to Solartech Systems Corporation, Lubbock, Tex.

Filed Apr. 17, 1978, Ser. No. 897,291
Int. Cl.² F24J *3/02*
U.S. Cl. 126—427 **9 Claims**



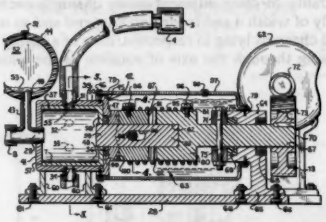
1. In a solar water heating system having
a. solar panels which transfer radiant heat from the sun to solar water tubes therein,
b. the solar tubes having
(i) inlets, and
(ii) outlets,
c. a solar water storage tank,
d. a supplemental water heater using a non-solar heat source,
e. at least one space heater which transfers heat from water therein to interior spaces,
f. at least one hot water tap tee which supplies hot water to washers, baths and lavatories, and
g. a source of pressurized portable water, the improved connections and controls comprising in combination:
h. the source of water connected to the inlet of the solar tubes,
j. the outlet of the solar tubes connected to the solar tank,
k. the solar tank connected to
m. a tank tee,
n. the tank tee connected to the supplemental heater,
o. the supplemental heater connected through all the space heaters and tap tees in series to
p. a loop tee,
q. the loop tee connected to the inlet of the solar tubes,
r. the loop tee directly connected by a short pipe to the tank tee, and
ss. a transfer pump located within the connection between the loop tee and the inlet of the solar tubes.

4,191,330

DRIP IRRIGATION SYSTEM FOR AGRICULTURE

Larry E. Sample, 5139 Ridge Ave. #266, Las Vegas, Nev. 89103

Filed May 19, 1978, Ser. No. 907,686
Int. Cl.² B05B *15/02*
U.S. Cl. 239—66 **12 Claims**



1. A drip irrigation system for agriculture, comprising:
(a) a plurality of water distribution lines adapted for extending across an area for growing crops; said lines being arranged in at least first and second separate groups thereof, wherein the lines in each of the groups are interconnected;
(b) a water source of pressurized, substantially unfiltered water selectively communicating with said water distribution lines;
(c) a plurality of water emitters connected with and spaced along each of said lines for discharging the water in said lines into the soil of the crop growing area; said emitters each having an orifice sized to generally allow foreign materials in said substantially unfiltered water to pass therethrough;
(d) a water distributor including:
(1) an outlet portion with first and second outlet ports connected with said first and second water line groups, respectively, and which has a hollow housing portion wherein said first and second ports are disposed, said housing portion having a cylindrical bore;
(2) a sequencing valve having a cylindrical rotor with a hollow interior and which is coaxially mounted within said bore of the housing for turning of the rotor therein, said rotor having a dispensing port in the wall thereof selectively and cyclically alignable with one of said first and second ports in said housing portion for directing water therethrough while simultaneously closing the other of said first and second ports, said cylindrical rotor being adapted to index between said first and second ports and sequentially and individually communicate said first and second water distribution line groups with said water source, whereby surges of pressurized, substantially unfiltered water rush cyclically through said lines to alleviate clogging of the orifices by foreign material in the water; and
(3) an inlet portion connected with said water source, and wherein said inlet portion leads into the hollow interior of said cylindrical rotor.

4,191,331

STREAM REVERSING DIRECTOR

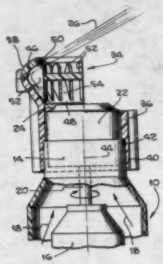
Jon A. Bivens, Upland, and Wilson V. Cochran, Riverside, both of Calif., assignors to The Toro Company, Riverside, Calif.

Filed Mar. 23, 1978, Ser. No. 889,257
Int. Cl.² B05B *3/08*
U.S. Cl. 239—231 **5 Claims**

1. In an irrigation sprinkler having a body with a rotating portion including a nozzle having an opening emitting a stream of irrigation water of cross-sectional diameter d and adapted for irrigating an area by rotating the rotating portion about an axis of rotation, the improvement for redirecting the stream of

water intended for a part of the area to another of the area comprising:

a redirector adapted for mounting to the sprinkler body and having a partial-cylindrical portion disposed concentric to the axis of rotation adjacent the rotating portion of the sprinkler for a portion of the path of rotation of the nozzle opening and including in said partial-cylindrical portion a plurality of close adjacent guide channels each substantially of width d and having an inlet end and an outlet end, said channels lying in respective ones of a family of planes passing through the axis of rotation of the rotating portion, said inlet ends being positioned closed adjacent the path of travel of the nozzle opening to sequentially receive the stream of water from the nozzle as the rotating portion rotates, said guide channels being shaped from said inlet ends to said outlet ends to confine and smoothly redirect the stream of water from the nozzle intended for a portion of the part of the area not to be watered toward a portion of the part of the area where said redirected water is desired while maintaining the redirected water stream substantially identical in size and break-up characteristics to the unredirected water stream.



4,191,332

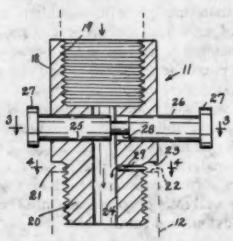
SHOWER HEAD FLOW CONTROL DEVICE

David J. De Langis, and Philip A. De Langis, both of 4060 W. 226th St., Torrance, Calif. 90505

Filed Jan. 10, 1978, Ser. No. 868,424

Int. Cl.[2] B05B 7/06

U.S. Cl. 239—428.5 **4 Claims**



1. A shower system comprising respective hot and cold water supply conduits including manually adjustable control valves, a common water supply pipe connected to said supply conduits, whereby water may be supplied to said supply pipe at a mixture temperature in accordance with the relative settings of said control valves, a shower head, a conduit fitting connected between said common supply pipe and said shower head, said fitting having a straight longitudinal bore extending between its opposite ends, an elongated valve element slidably engaged transversely in said fitting and intersecting said bore, at least one end of said valve element projecting laterally from said fitting, said valve element being formed with an annular peripheral groove having an axial length slightly less than the diameter of said longitudinal bore, registrable at times with said longitudinal bore and being movable to selected flow-restricting positions to adjustably control the velocity of liquid flow through the fitting to the shower head and being movable at other times to a flow-blocking position relative to said bore, wherein said fitting has a reduced externally threaded lower end portion defining a peripheral shoulder, said externally threaded lower end portion being tightly threadedly engaged with the shower head and having a length providing an annular clearance space between the shower head and said peripheral shoulder, and wherein the wall of said reduced lower end portion adjacent to said shoulder is formed with a small air-aspirating passage communicating with said clearance space, whereby said clearance space and air-aspirating passage define a venturi passage to allow air to be aspirated into the water stream passing into the shower head, causing the air to mix with the water, the air-aspirating passage being located relatively close to the shower head, whereby the back pressure developed in the shower head can be readily overcome by suitably adjusting the restrictive position of the groove to provide the required velocity of the water stream.

4,191,333

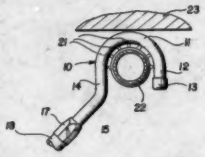
FLAME TIP FOR SOLDERING TORCH

Ralph Rene, 455 Paulison Ave., Passaic, N.J. 07055

Filed Aug. 14, 1978, Ser. No. 933,516

Int. Cl.[2] F23D 13/36

U.S. Cl. 239—543 **1 Claim**



1. A flame tip for a soldering torch to facilitate soldering around a pipe in close quarters, comprising a single substantially rigid tube section which is externally threaded at one end for coupling to a flexible hose extending from a burner device, whereby the tube section can be easily and safely manipulated by hand to a variety of positions without being restrained in its movements, a closure cap for the end of the tube section remote from said threads and hose, the tube section including a comparatively short straight portion extending forwardly of said threads, an elbow at the forward end of the straight portion, a substantially semi-circular body portion extending forwardly from the elbow and having a center lying substantially on the axis of said straight portion, and another comparatively short straight portion leading from the semi-circular body portion and carrying said closure cap, said semi-circular body portion being provided in its interior side with a plurality of circumferentially equidistantly spaced radial flame jet apertures whose axes converge to the center of the semi-circular body portion.

4,191,334

CABLE TIE

John J. Bulanda, and John E. Lopata, both of New Lenox, Ill., assignors to Panduit Corp., Tinley Park, Ill.

Filed Apr. 25, 1978, Ser. No. 899,774

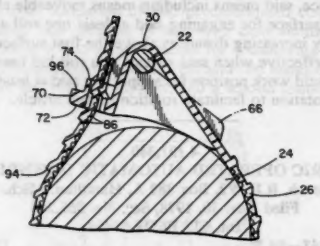
Int. Cl.[2] F16L 33/00

U.S. Cl. 24—16 PB **6 Claims**

1. A one-piece cable tie for attaching one or more elongate objects such as electrical conductors to a support wire, said tie comprising,

an elongate flexible strap;

a locking head joined to one end of said strap and including a strap entry face, a strap exit face and a strap-receiving aperture extending therebetween for receiving the other end of said strap, said strap including spaced transverse abutments and said locking head having a locking pawl engageable with said abutments for maintaining a threaded strap in said locking head; and



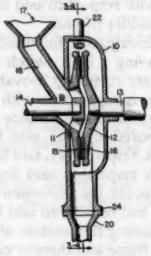
at least one relatively rigid leg extending from said locking head between said strap and said strap entry face with said strap disposed between said leg and said strap exit face, said leg being offset relative to said strap so that said strap can be deflected toward, threaded into and drawn tight in said locking head without interference from said leg whereby said strap formed into a single loop and passed through said locking head holds said objects and said wire spaced from one another by said leg.

4,191,335

DRY REFINING PROCESS AND APPARATUS

Giancarlo A. Cavagna, Silver Spring, Md., assignor to Westvaco Corporation, New York, N.Y.

Filed Jan. 8, 1979, Ser. No. 1,428
Int. Cl.² B09C 7/02
U.S. Cl. 241—17 **5 Claims**



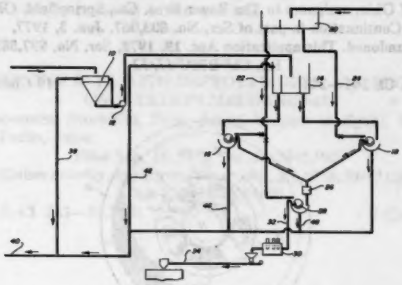
1. Method for dry refining cellulosic fibrous material to produce convoluted, fiberized cellulose fibers which are twisted and bent in a substantially lasting manner without producing knots or fiber bundles comprising, introducing the fibrous material in a substantially dry state into a refiner housing having opposed disk refining surfaces, flowing said material between the relatively opposed refining surfaces located within said refiner housing, causing one or more of said refining surfaces to rotate relative to other refining surfaces so as to operate on said material and liberate the individual fibers thereof as the material flows between said surfaces and removing the liberated fibers from the refiner housing, the improvement wherein, during the refining action, one or more sources of air is introduced into the refiner housing at the periphery thereof in the region between the ends of the milling disks and the refiner housing walls to prevent the liberated pulp fibers from becoming trapped between the ends of the refining surfaces and the refiner housing walls while maintaining the refiner in a relatively cool condition.

4,191,336

PROCESS FOR RECOVERING MAGNETITE FROM FLY ASH

Jim W. Brown, 211 Country Club La., Carterville, Ill. 62918

Filed Dec. 11, 1978, Ser. No. 967,969
Int. Cl.² B02C 23/14
U.S. Cl. 241—21 **11 Claims**



1. A process for recovering magnetite from fly ash comprising the steps of; making a slurry of fly ash and a liquid, delivering of the slurry to a magnetic separator, separating magnetite from the remainder of the fly ash with the magnetic separator, crushing the magnetite, separating the crushed magnetite from other materials with a second magnetic separator having a weaker magnetic field then the first mentioned magnetic separator, and drying the crushed magnetite.

4,191,337

APPARATUS FOR BREAKING UP VEGETABLE MATTER

Clifford A. Wilson, Nassau, The Bahamas, assignor to Rotocrop International, Ltd., Nassau, The Bahamas

Filed Dec. 6, 1977, Ser. No. 857,978
Claims priority, application United Kingdom, Oct. 31, 1977, 45276/77
Int. Cl.² B02C 18/18
U.S. Cl. 241—224 **6 Claims**

1. Apparatus for breaking up organic matter comprising a frame supporting a rotatable shaft having an elliptical blade mounted thereon such that the periphery of the blade generates a cylindrical surface upon rotation of the shaft; and a housing defining a delivery passage for said vegetable matter and including a drum in which the shaft rotates, said delivery passage terminating in an opening formed in the drum with two spaced edges, at least one of which lies on said cylindrical

surface for shearing engagement with the periphery of the blade as the shaft rotates, and the drum defining a discharge aperture substantially opposite said opening, the arrangement being such that vegetable matter fed to the delivery passage is broken up as it passes through said opening, and discharged radially across the cylindrical surface through said aperture.

4,191,338

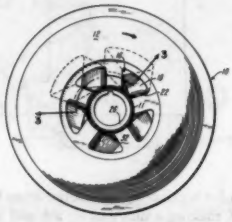
INFEED DISC FOR DISC-TYPE REFINERS

William E. Lyons, Springfield, and John J. Egan, Dayton, both of Ohio, assignors to The Bauer Bros. Co., Springfield, Ohio

Continuation-in-part of Ser. No. 803,067, Jun. 3, 1977, abandoned. This application Apr. 19, 1978, Ser. No. 897,583

Int. Cl.[2] B02C *17/12*

U.S. Cl. 241—245 **19 Claims**



1. An infeed disc for a disc refiner comprising a plate unit having a first aperture for mount thereof to and rotation by a drive shaft, said plate unit having an infeed face and an operating face and at least one additional aperture forming an infeed passage one end of which opens from said infeed face and the other of which opens from said operating face, said passage being skewed and essentially curved as it extends from said one end thereof to the other and said other end of said passage being circularly offset from said one end thereof in a path about said first aperture.

4,191,339

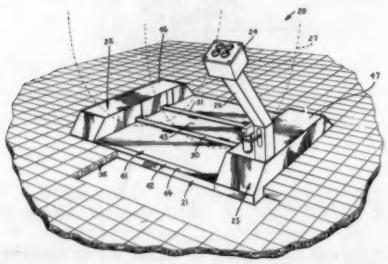
APPARATUS FOR SUPPORTING A REEL OF CABLE FOR ROTATION

Helmut E. Durr, Dunwoody, and George E. Mock, Duluth, both of Ga., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed Feb. 28, 1979, Ser. No. 15,982

Int. Cl.[2] B65H *75/02*

U.S. Cl. 242—54 R **10 Claims**



1. An apparatus for supporting a cylindrically shaped article for rotation, said apparatus comprising:

a pair of parallel rolls which are spaced apart a distance which is less than the diameter of an end section of a cylindrically shaped article to be supported thereon;

means for supporting at least one of said rolls in a rest position between a first surface and a second surface;

means for supporting the cylindrically shaped article in engagement with said second surface between said rolls;

means for causing said at least one roll to be moved from said rest position into engagement with said cylindrical article and then to be further moved into a work position to cause said article to be supported by said rolls above said second surface, said means including means moveable along said first surface for engaging said at least one roll at successively increasing distances above the first surface; and

means effective when said at least one roll has been moved into said work position for supporting said at least one roll for rotation to facilitate rotation of said article.

4,191,340

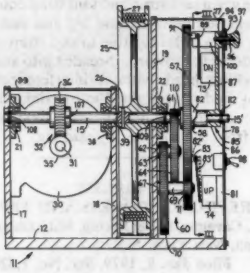
ELECTRIC OPERATED AUTOMATIC DOWNRIGGER

Emil Kubanek, R.R. #2, Box 380 A, Hamilton, Mich. 49419

Filed Nov. 30, 1978, Ser. No. 965,260

Int. Cl.[2] B65H *63/08*

U.S. Cl. 242—54 R **10 Claims**



1. Apparatus for use as a downrigger in trolling, comprising:

a frame;

reel means rotatable with respect to said frame for winding and unwinding a quantity of line;

electric motor means energizable for rotating said reel;

limit switch means having a limit switch and an actuating cam means which are relatively movable such that the actuating cam means is engageable with said limit switch for tripping same to shut off said motor means;

first and second supports carrying said limit switch and actuating cam means, respectively, said first support being normally fixed with respect to said frame, said second support being connected for movement in proportional relation to said reel and relative to said first support;

means actuable for adjusting the position of said limit switch with respect to said frame and thereby changing the position of said second support along its path of travel at which said limit switch and actuating cam means come into said tripping relation to shut off said motor;

whereby to automatically stop unwinding of line from said reel means when a preset length has been unwound.

4,191,341

WINDING APPARATUS AND METHOD

Gottlieb Looser, Rigistrasse 28, Zurich, Switzerland

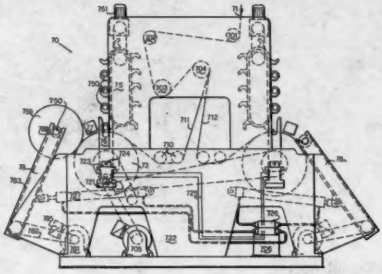
Filed Apr. 3, 1979, Ser. No. 26,134

Int. Cl.[2] B65H *19/20*

U.S. Cl. 242—56 A **12 Claims**

1. In an apparatus for continuously winding a web of material onto a series of core mandrels; said apparatus comprising: a rotatable winding drum for contacting engagement with said web and for guiding said web onto a core mandrel; a core mandrel supply; a first core mandrel support for contacting an empty core mandrel from supply with said winding drum to

commence winding of said web onto said empty core mandrel and to produce a partially web-wound core mandrel; a second core mandrel support for receiving a partially web-wound core mandrel from said first core mandrel support and for maintaining said web-wound core mandrel near said winding drum until a predetermined coil of said web is formed on said web-wound core mandrel; a drive means associated with said rotatable winding drum for rotating same; a means for cutting said web after formation of said predetermined coil and for commencing said winding of said web onto another empty core mandrel; a first transfer means for transferring said partially web-wound core mandrel from said first mandrel support to said second mandrel support; and a second transfer means



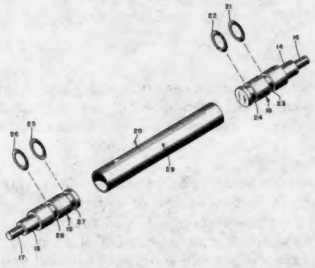
for discharging said web-wound core mandrel with said predetermined coil of said web thereon from said second core mandrel support; the improvement consisting of a force-sensing device in operative connection with said winding drum for sensing a force exerted against said winding drum by said web-wound core mandrel on said second core mandrel support when in contacting relation; a core mandrel drive means for rotating said web-wound core mandrel when on said second core mandrel support; a compensator means for counter-acting said force exerted against said winding drum by said web-wound core mandrel; and a means connected to said force-sensing device for actuating said compensator means so as to at least partially counter-act said force exerted against said winding drum.

4,191,342

ADJUSTABLE ROLL MANDREL

Ronald W. Reinhold, 4426 Buttercup La., East, Traverse City, Mich. 49684

Filed Jul. 10, 1978, Ser. No. 923,333
Int. Cl.² B65H *75/02*
U.S. Cl. 242—68 **3 Claims**



1. A roll mandrel having a tubular central portion for supporting a roll of strip material, and two members having journal portions of reduced diameter at opposite ends respectively one of said members being axially moveable with respect to the other thereof within said tubular central portion, wherein the improvement comprises:

a tube constituting said tubular central portion, and having a hole in the wall thereof in an axially central position;

said members being a pair of plunger members each having one of said journal portions integral therewith, and slideably received in said tube, each of said plunger members having a plurality of different journal diameter sections; and

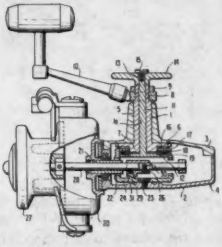
resistance means interposed between said plunger members and said tube to maintain the adjusted axial position of said plunger members within said tube.

4,191,343

SPINNING REEL WITH IMPROVED DRAG AND SPOOL OSCILLATION MECHANISMS

Yasomatsu Morishita, Kure, Japan, assignor to Ryobi, Ltd., Fuchu, Japan

Filed Sep. 26, 1978, Ser. No. 945,993
Claims priority, application Japan, Jul. 20, 1976, 51-97125[U]
Int. Cl.² A01K *89/01*
U.S. Cl. 242—84.21 R **7 Claims**



1. A spinning reel including a spool, a spool shaft connected thereto, a rotor, a reel housing, a handle and a spool reciprocating means, comprising:

(a) a hollow shaft rotatably supported by said reel housing, said hollow shaft having one end formed with an anti-reversing gear and a support disc extending inwardly from and coaxially with said gear, and the other end fixed to said handle,

(b) a drag control shaft slidably supported in said hollow shaft, said drag control shaft having an inner end formed with a disc member positioned in parallel with said anti-reversing gear, and an outer end formed with a thread,

(c) a rotor drive wheel disposed between said anti-reversing gear and said disc member and fitted on said support disc, said rotor drive wheel beng meshed with a pinion to rotate said rotor, and said spool shaft being slidably fitted in said pinion,

(d) a resilient means disposed between said disc member and said rotor drive wheel for spring-biasing said disc member to urge the rotor drive wheel toward said anti-reversing gear,

(e) a drag control knob threadingly engaged with said thread portion of said drag control shaft, said knob being contacted with said hollow shaft to move said disc member for controlling the biasing force of said resilient means to thereby control slippage of said rotor drive wheel relative to said anti-reversing gear,

(f) a spool oscillation gear rotatably secured to said reel housing at a position symmetrical with said rotor drive wheel and on the opposite side of the spool shaft therefrom, said spool oscillation gear being meshed with said pinion and rotatable in a reverse direction from that of said rotor drive wheel,

(g) a pin member extending upwardly from said oscillation gear, and

(h) an oscillating piece fixedly secured to said spool shaft,

said oscillating piece being formed with a groove at a lower surface thereof adapted to slidingly receive said pin member.

4,191,344

DEVICE FOR CAUSING ROTATION, HAVING A PRESSURIZED TUBULAR DRIVE MEANS

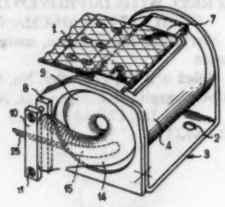
Jean-Francois Tillac, Bordeaux Cauderan, France, assignor to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Apr. 6, 1978, Ser. No. 893,945

Claims priority, application France, Apr. 20, 1977, 77 11940

Int. Cl.[2] A62B *35/00*; B65H *75/48*

U.S. Cl. 242—107 **22 Claims**



1. A device for protecting people in a vehicle which comprises a frame fixed on the fixed chassis of the vehicle, a movable element capable of rotating relative to said frame, a displaceable element such as a safety belt connected to said movable element, a drive means for causing the rotation of the movable element with respect to the frame, the drive means comprising at least one flexible tube which in normal operation is rolled up, said flexible tube being connected at at least two portions thereof to said frame, and to said movable element, said tube being responsive to an increase in pressure to occupy greater volume and to acquire an expanded position, thereby tending to unroll and to thus rotate the movable element, pressurizing means responsive to signaling means setting free pressurized fluid, said pressurized fluid causing an increased pressure on said flexible tube, said flexible tube being joined to said pressurizing means.

4,191,345

TAPE CASSETTE

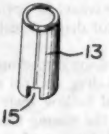
Takateru Sato, and Shigemasa Shoji, both of Tokyo, Japan, assignors to TDK Electronics Company, Limited, Tokyo, Japan

Filed Aug. 8, 1978, Ser. No. 932,017

Claims priority, application Japan, Nov. 24, 1977, 52-157732[U]

Int. Cl.[2] G03B *1/04*

U.S. Cl. 242—197 **3 Claims**



3. In a tape cassette comprising first and second half-cases, a reel disposed therein, a tape fed from said reel and a cylindrical tape guide for guiding tape fed from said reel, an improvement therein which comprises;

said tape guide includes a surface layer formed by a hard chromium plating or nickel plating, wherein said cylindrical tape guide further includes a slit formed in the axial direction thereof;

a post extending from said first half-case; and

a projection extending from said post wherein said cylindrical tape guide includes a groove in at least one end thereof which is fitted to said projection.

4,191,346

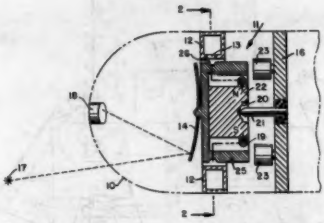
TARGET SEEKING GYRO

William B. McLean, deceased, late of San Diego, Calif. (by LaVerne J. McLean, Mark A. McLean, and California Bank, trustees), assignor to Walter G. Finch, Baltimore, Md.

Continuation of Ser. No. 337,899, Feb. 19, 1953, abandoned, and a continuation of Ser. No. 583,337, May 7, 1956, Pat. No. 4,093,154. This application Jun. 17, 1976, Ser. No. 697,189

Int. Cl.[2] F42B *13/28*; F41G *7/10*; G01C *19/53, 19/28*

U.S. Cl. 244—3.16 **64 Claims**



1. In combination,

a spin stabilized body;

means for generating a signal having a frequency proportional to the spin frequency of said body; and

means responsive to said signal for precessing the body.

4,191,347

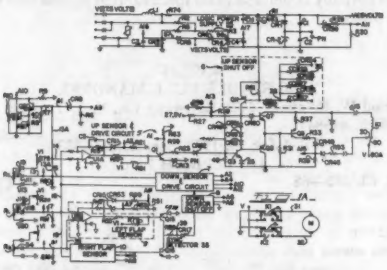
FLAP CONTROL CIRCUITRY

Albert Fueyo, Mount Prospect, Ill., assignor to Calco Manufacturing Company, Addison, Ill.

Filed Oct. 5, 1977, Ser. No. 839,424

Int. Cl.[2] B64C *13/00*

U.S. Cl. 244—76 A **4 Claims**



1. An aircraft flap sensing and comparing circuit for comparing the movement and position of the flaps on an aircraft which flaps are driven by a motor selectively connected to a power source and are controlled by a control unit, comprising in combination:

first means for obtaining a first analog voltage responsive to the position and movement of a first flap;

second means for obtaining a second analog voltage responsive to the position and movement of a second flap;

sensing means for sensing and comparing said first and second voltages and providing an output when said voltages are unequal above a given tolerance;

first and second relay contacts connecting said power source to said motor;

said first relay contacts being responsive to movement of

said control unit in a first direction to connect the power source to drive said motor in a first direction of rotation;

said second relay contacts connecting said power source to said motor to drive said motor in a second and relatively reverse direction; and,

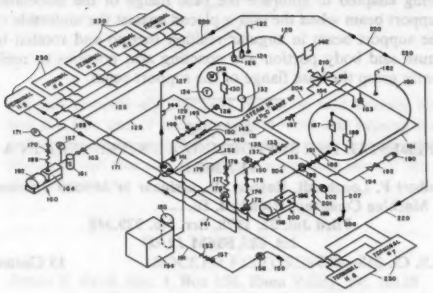
said first and second relay contacts connected in a relatively bucking relation such that when both said first and second relay contacts are energized, equal power is provided to opposite sides of the motor, and the motor will be caused to stop.

4,191,348

DEICING SYSTEM

Sidney J. Holwerda, Hudsonville, Mich., assignor to Holwerda-Huizenga Co., Grand Rapids, Mich.

Filed Nov. 10, 1977, Ser. No. 850,229
Int. Cl.[2] B64D *15/10*
U.S. Cl. 244—134 C **32 Claims**



23. A method for deicing aircraft comprising:

providing a stationary centrally located source of heated water;

providing a stationary centrally located source of deicing fluid;

providing a plurality of stationary distribution terminals and locating same remote from said sources, each terminal including means for coupling an applicating hose thereto;

coupling each of said centrally located sources to said terminals through conduit means for delivery of deicing fluid to said coupling means; and

providing a mixing valve means coupled to said conduits for selectively mixing water and deicing fluid delivered to coupling means; and

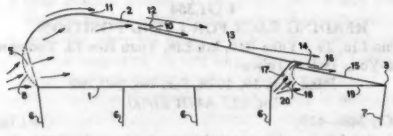
coupling an applicating hose to any of said terminals and applying deicing fluid mixed with heated water to an airplane located at said terminal.

4,191,349

PARACHUTE HAVING AN IMPROVED MULTI-CELL CANOPY

Marcel H. Pravaz, Clichy, France, assignor to Cabinet Lavoix, Paris, France

Filed Jul. 19, 1978, Ser. No. 926,523
Claims priority, application France, Mar. 24, 1978, 78 08664
Int. Cl.[2] B64D *17/14*
U.S. Cl. 244—145 **6 Claims**



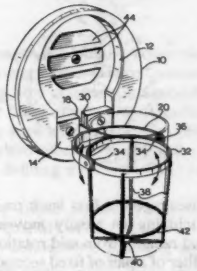
1. A parachute having a multi-cell canopy of the gliding wing type having a leading edge and trailing edge, comprising an upper wall and a lower wall, a part of the upper wall and a part of the lower wall defining therebetween an opening adjacent the leading edge for entry of air which inflates the canopy, a part of the upper wall and a part of the lower wall also defining therebetween a plain flap adjoining the trailing edge, an air outlet passage in the shape of a slot in the upper wall, the slot being located in a region of said part of the upper wall defining the flap a little in front of the trailing edge relative to the direction of gliding, an opening in the lower wall and communicating with said outlet passage, a closing wall extending from the lower wall to the upper wall for closing a part of the canopy located in front of said opening in the lower wall relative to the direction of gliding, the part of the canopy forming said flap being open in a front part and communicating with said opening of the lower wall.

4,191,350

STORABLE HOLDER FOR A CONTAINER

William Ormond, 233 Hillcrest Ave., Hamilton, Canada (L8P 2X3)

Filed May 1, 1978, Ser. No. 901,641
Int. Cl.[2] A47F *5/00*; A47K *1/08*
U.S. Cl. 248—293 **6 Claims**



1. A storable holder for a container, such as a glass, cup, mug, bottle or can comprising:

a base member adapted for mounting on a surface;

a yoke member pivoted to the base member for movement about a yoke axis between a stored position in which it is alongside the base member and a operative position in which it extends from the base member;

a ring member pivoted to the yoke member about a ring axis and movable therewith between corresponding stored and operative positions, the ring member being urged by gravity in the operative position to a stable horizontal attitude;

the ring member comprising a rigid ring and at least one depending flexible loop-like member including ferromagnetic material connected at its ends to the rigid ring and embracing the bottom of a container in the ring member to retain the container in the holder; and

a magnet on the base member against which the loop-like member can be retained by magnetic attraction of the ferromagnetic material when the yoke and ring members are in their stored positions.

4,191,351

MOUNTING FLUID FLOW APPARATUS

Thomas E. Goyne, Denver, Colo., assignor to Cobe Laboratories, Inc., Lakewood, Colo.

Filed Oct. 20, 1977, Ser. No. 844,144
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—311.1 R **15 Claims**

1. A mount for a fluid flow transfer device for facilitating

rotation of said device from an upright position to an inverted degassing position, said mount comprising:

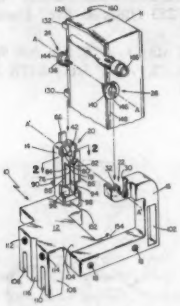
a base;

two arms rigidly connected to said base for extending adjacent to opposite sides of said device,

a first bearing surface on each said arm for cooperating with a second bearing surface on each of said opposite sides of said device to permit rotation of said device with respect to said mount about an axis of rotation passing through the rotational centers of said bearing surfaces;

one of said bearing surfaces being open at its upper surface to receive said other bearing surface when said device is translated radially with respect to said axis of rotation and said device and mount are angularly oriented about said axis in an installation position,

retention means at said axis of rotation for preventing relative radial translation of said first and second bearing surfaces when said device and mount are angularly oriented in other positions than said installation position, and



a selectively disengageable first latch on one of said arms, said latch including an axially moveable first latching surface spaced radially from said rotation axis for cooperating with either of a pair of fixed second latching surfaces on said device equally spaced radially from said rotation axis the same distance as said first latching surface is spaced from said axis,

one of said latching surfaces having a ramp portion inclined with respect to the other said latching surface to move said first latching surface axially away from said device momentarily to allow said latching surfaces to engage,

whereby said device can be inserted in said mount by translating said device relative to said mount while in said installation orientation such that said first and second bearing surfaces engage, and

whereby said device, once inserted, can be rotated between operating and degassing positions while retained by first and second bearing surfaces and said retention means, and can be locked into place at each position by engagement of said first and second latching surfaces.

4,191,352

ROTATABLY INSTALLED SUSPENSION CLIP

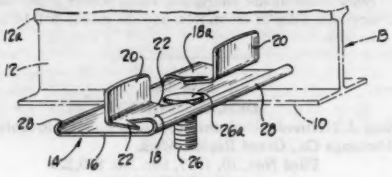
Jerome T. Schuplin, Parma Heights, Ohio, assignor to Fastway Fasteners, Inc., Lorain, Ohio

Filed Aug. 21, 1978, Ser. No. 935,356

Int. Cl.[2] A44B *21/00*; E04C *17/18*

U.S. Cl. 248—317 **20 Claims**

1. A suspension clip adapted for rotatable installation on an associated support beam having a base flange such as for instance an inverted T-beam, said clip comprising a generally flat body portion formed from sheet-like generally resilient material, and having a lengthwise axis, and including reversely bent arm portions on opposite edges of said body portion, said arm portions extending generally parallel to said body portion on the same side thereof and extending toward but not through a lengthwise plane perpendicular to the plane of said body portion passing through and generally containing said axis of said body portion, and each of said arm portions including a tab portion extending generally perpendicular to said plane of said body portion, said body portion and coacting arm portions



being adapted to embrace the base flange of the associated support beam when the clip is placed against the underside of the support beam in angular relation thereto and rotated to cause said body portion and coacting arm portions to resiliently grasp the base flange of the support beam.

4,191,353

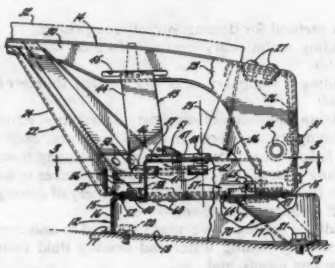
PEDESTAL FOR SUPPORTING A SWIVEL SEAT IN A VEHICLE

Robert F. Leonhardt, Roscoe, Ill., assignor to Atwood Vacuum Machine Company, Rockford, Ill.

Filed Jul. 31, 1978, Ser. No. 929,348

Int. Cl.[2] F16M *13/00*

U.S. Cl. 248—425 **13 Claims**



1. A pedestal adapted to be anchored to the floor of a vehicle and adapted to support a vehicle seat for turning about an upright axis, said pedestal comprising a stationary base having a lower side adapted to be positioned on the vehicle floor, a platform for supporting the seat and located on the upper side of said base, a bearing between the upper side of said base and the lower side of said platform and mounting said platform to turn on said base and about an upright axis, a clamp secured to the upper side of said base and holding said platform downwardly against said bearing, a tie strap having an upper end connected to said clamp, and means for anchoring the lower end of said strap rigidly to the vehicle floor.

4,191,354

READING RACK FOR LYING POSITION

Su Chia-Liu, 29-1 Yuan Ben, 8th Lin, Yuan Ben Li, Young mei, Tao-Yoan Hsien, Taiwan

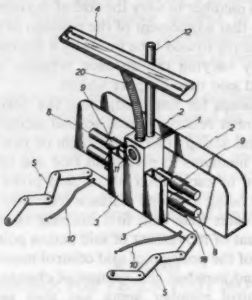
Filed Sep. 19, 1978, Ser. No. 943,799

Int. Cl.[2] A47B *23/00*

U.S. Cl. 248—445 **6 Claims**

1. A stand for reading material comprising a base member, a flexible arm extending upwardly from said base member, and a support assembly extending from a free end of said arm, said

assembly including a bearing block mounted to the free end of said arm, a support rod axially adjustably mounted in said bearing block, a first pair of foldable articulated arms extending laterally from said bearing block on opposite sides of the



rod axis respectively clamping means on said bearing block and at a free end of said rod remote from said bearing block and a second pair of foldable articulated arms extending laterally from said free end of said rod on opposite sides of the rod axis respectively.

4,191,355

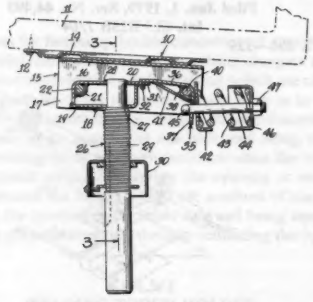
ROCKER FIXTURES

James K. Faull, Rte. 1, Box 156, Enon Valley, Pa. 16120

Filed Jun. 15, 1978, Ser. No. 915,821

Int. Cl.[2] F16M *13/00*

U.S. Cl. 248—594 **11 Claims**



1. A rocker fixture for a chair and adapted to be interposed between a floor-engaging base of said chair and a person-supporting seat of said chair, said fixture comprising:

a support adapted to be secured to the undersurface of said seat,

an upright post adapted to have its lower end supported from said base,

a head bracket secured to the upper end of said post, said bracket having a first pivotal connection with said support whereby when the latter is connected to said seat and said post is supported on said base, said support and said seat may be tilted about said first pivotal connection,

a lever member having a second pivotal connection with said support, said lever member having a portion in abutting relation with a portion of said head bracket and slidable with respect thereto when said support is tilted about said first pivotal connection, and

means for resiliently holding said lever member portion in abutting relation with said bracket portion in any position of said support.

4,191,356

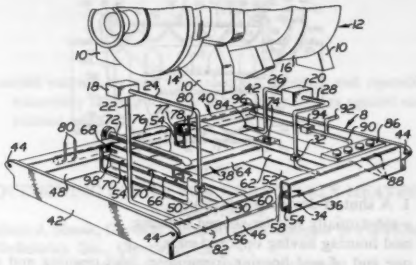
ENGINE MOUNTING BASE

Raymond V. Ashmun, Peoria; Steven R. Baker, Magnolia, and Jerry A. Damerell, Washburn, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 8, 1978, Ser. No. 913,931

Int. Cl.[2] F16F *15/00*

U.S. Cl. 248—678 **18 Claims**



5. An engine mounting base (8) comprising:

first hollow frame means (34) for containing a preselected quantity of a fluid at generally atmospheric pressure, said first hollow frame means (34) including first and second substantially parallel elongate tubes (46,48) having closed ends and a third tube (50) connected to said pair of tubes (46,48) and defining a common fluid chamber (54) therewith; and

second hollow frame means (36) for containing another preselected quantity of said fluid at a preselected pressure level above atmospheric pressure, said first and second hollow frame means (34,36) being connected.

4,191,357

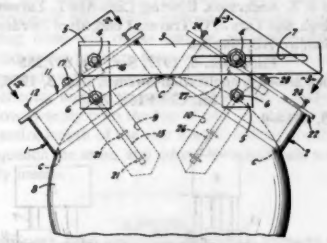
DUPLICATOR FOR BOWLING BALL FINGER AND THUMB HOLES

James G. Nesbitt, 431 Duncan Ave., Stockton, Calif. 95207

Filed Jul. 7, 1978, Ser. No. 922,667

Int. Cl.[2] E04G *17/00*

U.S. Cl. 249—205 **9 Claims**

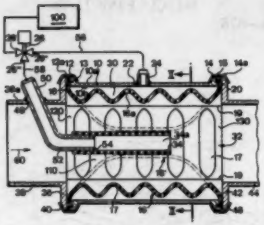


1. An apparatus for supporting a core rod to be used in duplicating at least one of the finger and thumb holes of one bowling ball in another bowling ball; comprising a member adapted to rest on and be supported by said one bowling ball adjacent such one hole, an element mounted on the member and overlying said hole, and securing means adapted to support the rod on the element and position said rod to depend into such hole in clearance relation to the sides thereof so that a casting of the hole may then be formed on said or rod.

4,191,358
SHUTOFF DEVICE

Johann W. Ferri, Uster, Switzerland, assignor to Luwa AG, Zurich, Switzerland

Filed Apr. 10, 1978, Ser. No. 895,042
Claims priority, application Switzerland, Apr. 15, 1977, 4692/77
Int. Cl.[2] F16K 7/07
U.S. Cl. 251—5 8 Claims

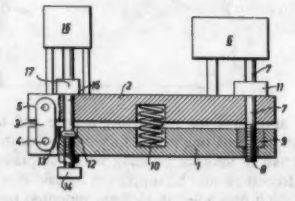


1. A shutoff device comprising:
a substantially tubular-shaped housing;
said housing having opposed ends;
one end of said housing forming an inlet opening and the other end of said housing an outlet opening;
said housing having an inner housing wall;
an elastic hose body having opposed ends;
means for securing the ends of said elastic hose body at the housing;
said elastic hose body defining a closable throughflow passage which flow communicates said inlet opening with said outlet opening;
said elastic hose body in conjunction with said inner wall of said housing forming a substantially ring-shaped pressure compartment;
a conduit connection arranged at said housing and opening into said ring-shaped pressure compartment;
said hose body having a number of folds extending essentially in parallelism to one another; and
said folds extending transversely with respect to said hose body and being arranged in rows extending in the lengthwise direction thereof.

4,191,359
CONTROL APPARATUS FOR CONTROLLING POSITIONING OF A CONTROL MEMBER

Roland J. E. Andersson, Bjarred; Lars-Ake L. Larsson, Loddekopinge, and Lars J. C. Traven, Lund, all of Sweden, assignors to Gambro AB, Sweden

Filed Dec. 5, 1977, Ser. No. 857,285
Claims priority, application Sweden, Dec. 3, 1976, 7613576
Int. Cl.[2] F16K 7/06
U.S. Cl. 251—9 20 Claims

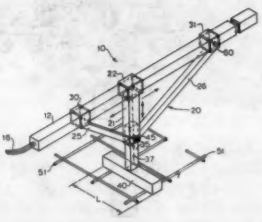


1. Apparatus for adjusting the position of a control member relative to a hollow flexible tube, comprising:
first and second members pivotally connected together to pivot about a pivot point;
a control member mounted on said first member and disposed at a first distance from said pivot point;
tube support means for supporting a hollow flexible tube on said second member relative to said control member so that said tube is adapted to be transversely compressed by said control member to vary the size of the opening of said tube and so that adjustment of the position of said control member relative to said tube provides a desired control of said tube by varying the distance between said control member and said tube support means;
fine control means for finely adjusting the position of said control member relative to said second member, said fine control means acting at an action point on one of said first and second members to pivot said first and second members relative to each other about said pivot point, said action point being a second distance from said pivot point which is greater than said first distance such that a selected amount of movement of said action point results in adjustment of the position of said control member relative to said second member, the amount of change in position of said control member being less than said selected amount of movement; and
coarse control means operatively associated with said control member for adjusting the position of said control member relative to said second member between a first position in which said fine control means is operative to finely adjust the position of said control member relative to said tube to thereby effect a change in control of said tube, and a second position in which said fine control means is inoperative to effect a change in control of said tube.

4,191,360
CONCRETE REINFORCEMENT MESH LIFTING TOOL

Donald R. Morrison, 2109 Camp Green St., Charlotte, N.C. 28208

Filed Jun. 1, 1979, Ser. No. 44,493
Int. Cl.[2] B25B 1/04
U.S. Cl. 254—129 1 Claim



1. A tool for levering concrete mesh wire, and the like, comprising:
(a) an elongated straight lever member formed of hollow metal tubing and having an outer lever end and an inner lift end, said lift end having rigidly secured thereto an outwardly extending concave metal point member adapted to engage strands of wire mesh and the like; and
(b) a lever support structure slidably and adjustably mounting said lever member intermediate the said lever and lift ends thereof, said support structure comprising:
(i) a central hollow tubular metal leg member extending outwardly below and in perpendicular relation to the longitudinal axis of said lever member and having at the upper end of said leg member a collar integrally secured thereto and slidably fitted on said lever member;
(ii) a pair of hollow tubular metal strut members having lower ends rigidly fixed to opposed lower surfaces of said central leg member and extending outwardly and upwardly therefrom to respective collars secured

thereto and slidably fitted on said lever member on opposite sides of said central leg member collar;

(iii) an auxiliary telescoping hollow tubular leg member slidably fitted within said central leg member and providing means for extending the length thereof, said auxiliary leg member having a hollow tubular metal ground support crossbar secured to the lower end thereof in an inverted T configuration and being of a length selected to span the mesh of reinforcement wire with which said tool is used;

(iv) locking means for locking said auxiliary leg member in a selected position on said central leg member to position the pivot point of said lever at a selected distance above the level of ground support; and

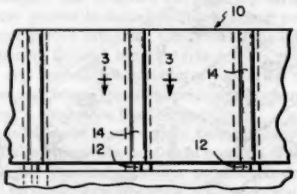
(v) means on said pivotal support structure for locking such structure to said lever member to locate the position of said pivot point along the length of said lever.

4,191,361

LOCKBAR FOR FENCE POST MOUNTING

Hans P. Jensen, Copenhagen, Denmark, assignor to Julius Koch USA Inc., New Bedford, Mass.

Filed Aug. 30, 1978, Ser. No. 938,109
Int. Cl.[2] E04H *17/00*
U.S. Cl. 256—12.5 **17 Claims**



1. Lockbars for fastening flexible concatenated structures to spaced, parallel, elongate fixtures comprising elongate sleeves having interior cross-section configurations which are complementary to portions of the elongate fixtures such as to enable telescopically sliding the sleeves axially onto said fixtures, each sleeve containing an opening at one side and being of such interior dimension as to bindingly accommodate the bight of the concatenated structure entering the opening at one side, extending around the fixture within the confines of the sleeve and leaving the opening at the other side and being tapered at one end in a plane intersecting the side containing the opening.

4,191,362

WELDING TORCH HOLDER

John R. Haynes, Tulsa, Okla., assignor to Head, Johnson & Chafin, Inc., Tulsa, Okla.

Filed Oct. 16, 1978, Ser. No. 951,603
Int. Cl.[2] B23K *7/00*
U.S. Cl. 266—48 **4 Claims**

1. A welding torch holder comprising:

a longitudinal flat member having a first longitudinal edge and a second longitudinal edge, a longitudinal toothed rack attached to the first edge, and clamping means to hold a welding torch securely;

a block member having a first body member and a second body member, the two body members releasably attached together and having an internal passageway for slidably receiving the longitudinal member therethrough, a securing arm extending outwardly from said first body member to attach the block member to a gantry;

means cooperating with said block member and said rack member to provide reciprocation between said longitudinal member and said block member;

a friction means situated in said passageway and interposed between said second body member and said second edge;

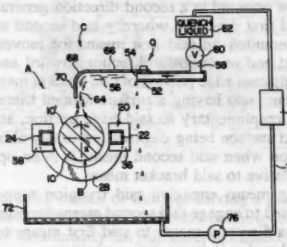
means carried by said second body member and operable externally thereof to urge said friction means against said second edge.

4,191,363

QUENCHING DEVICE FOR INDUCTIVELY HEATED WORKPIECES

Robert J. Shank, Garfield Heights, Ohio, assignor to Park-Ohio Industries, Inc., Cleveland, Ohio

Filed Aug. 23, 1978, Ser. No. 935,949
Int. Cl.[2] C21D *1/66*
U.S. Cl. 266—129 **12 Claims**



1. A device for directing quench fluid from a supply thereof onto the top of an inductively heated circumferential surface portion of a workpiece rotating about a central axis and axially stationary, said device comprising: supply means including an outlet end offset completely to one side of and out of overlying relation to, and substantially coextensive with, said heated surface portion of said axially stationary rotating workpiece for directing from said outlet end an unconstrained jet of quench fluid under pressure from a position spaced horizontally from said surface portion out of overlying relation thereto, deflector means intercepting and guiding said quench fluid jet downwardly onto the top of and throughout substantially the entire length of the said heated surface portion from above to quench the same, and means for selectively actuating said supply means.

4,191,364

SUPPORT FOR METALLURGICAL VESSELS

Harry T. Montgomery, New Castle, and Rashed N. Nagati, Mars, both of Pa., assignors to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Filed Apr. 20, 1978, Ser. No. 898,293
Int. Cl.[2] C21C *5/50*
U.S. Cl. 266—246 **13 Claims**

1. A metallurgical vessel including:

a trunnion support at least partially surrounding said vessel,

a plurality of bracket means affixed to said vessel in a spaced

relation and engaging said trunnion support, each bracket means having an edge portion extending generally in a first direction away from said vessel,

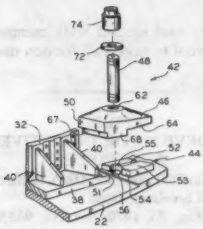
retainer means associated with each bracket means for limiting the movement thereof relative to said trunnion support,

each said retainer means including a first means, a second means and clamping means,

said first means being affixed to said trunnion support adjacent to the edge portion of its associated bracket means

one of said first and second means having an elongate groove formed therein and the other having a complimentary guide portion,

said second means being removably mounted on said first means, and with said guide portion disposed in said



groove, said first and second means being arranged with said groove oriented in a second direction generally normal to said first direction whereby said second means is slideably mounted on said first means for movement in said second and an opposite direction toward and away from the adjacent edge portion of said bracket means, said second means also having a surface formed thereon and generally complimentary to said edge portion, at least a part of said surface being disposed vertically above said edge portion when said second means is in an operative position relative to said bracket means,

said clamping means engaging said trunnion support and being adapted to engage said second means for releaseably clamping said second means to said first means to retain said second means in its operative position.

4,191,365

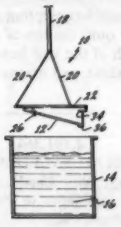
HORIZONTAL/INCLINED SUBSTRATE HOLDER FOR LIQUID PHASE EPITAXY

Charles F. O'Neill, Escondido, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 2, 1979, Ser. No. 16,884

Int. Cl.[2] B25B *11/00*

U.S. Cl. 269—46 **7 Claims**



1. A substrate holder adapted for practicing liquid phase epitaxy, comprising:

a dipping rod,

substrate holding means connected to one end of said rod including means holding said substrate at a tilt the angle of which is defined thereby relative to a horizontal plane when said substrate is free of liquid epitaxy melt and permitting said substrate to assume a horizontal position while yet contained in said substrate holder when said substrate is within an epitaxy melt.

4,191,366

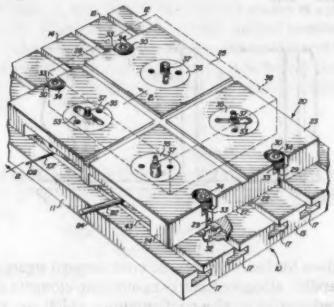
UNIVERSAL PLANETARY CLAMPING DEVICE

Yehuda Rabin, South Caulfield, Australia, assignor to Dart Industries Inc., Los Angeles, Calif.

Filed Jan. 30, 1978, Ser. No. 873,458

Int. Cl.[2] B23D *7/08*; B23Q *1/08*

U.S. Cl. 269—47 **17 Claims**



1. For use in combination with a machine tool having a work support surface, an improved fixture for attachment to said support surface and for holding a work piece during machining operations by said machine tool, said improved fixture comprising:

(a) a substantially rigid plate including,

i. a base surface for resting upon the support surface of said machine tool,

ii. a bearing surface for receiving said work piece thereagainst and spaced from said base surface, and

iii. an edge surface extending between said base surface and said bearing surface;

(b) a bore extending through said plate between said base surface and said bearing surface;

(c) an insert having a first end positioned proximate said bearing surface and a second end, said insert disposed within said bore for movement along the longitudinal axis thereof;

(d) an aperture extending through said insert between the first and second ends thereof; a pin having first and second ends and receivable within the aperture in said insert;

(e) attachment means carried by said insert and having work piece engaging means carried proximate the first end of said pin and extending from the first end of said insert;

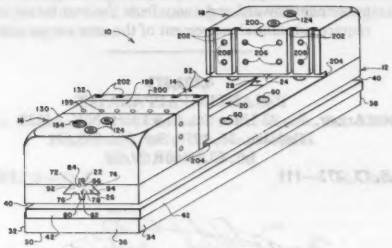
(f) connection means for detachably securing said pin to said insert; and

(g) actuator means carried by said plate for retracting said insert relative said bearing surface and urging said work piece into contact with said bearing surface.

4,191,367
FLUID-OPERATED VISE WITH JAW MOUNTING SYSTEM

Arthur S. Speiser, 4400 Clarkwood Pkwy., Warrensville Hts., Ohio 44128, and Samuel G. Sheterom, Jr., 25 Wintergreen Hill, Painesville, Ohio 44077

Continuation-in-part of Ser. No. 851,839, Nov. 16, 1977, Pat. No. 4,101,119. This application Jun. 13, 1978, Ser. No. 914,157
Int. Cl.² B25B *1/02*
U.S. Cl. 269—203 **13 Claims**



1. A fluid-operated vise, comprising:

(a) an elongate base structure having a top surface and an undercut groove including inclined surface portions, the undercut groove extending substantially the full length of and opening through the top surface;

(b) first and second jaw structures supported on the top surface and being movably positionable therealong for gripping a workpiece therebetween;

(c) first and second downwardly facing elongate grooves provided, respectively, in bottom portions of the first and second jaw structures the first and second downwardly facing grooves being of substantially identical cross section and communicating along their lengths with the undercut groove as the first and second jaw means are positioned along the length of the top surface;

(d) first and second elongate key members each having lower cross sectional portions configured to correspond to the undercut cross section of the undercut groove and being positioned therein, and each having upper cross sectional portions configured to correspond to the cross section of the downwardly facing grooves and being positioned therein, whereby the key members maintain alignment of the first and second jaw structures and the base structure as the jaw structures are positioned along the length of the top surface;

(e) first and second clamping means for clamping the first and second key members into engagement with the inclined surface portions to releasably retain the first and second jaw structures in place at selected positions along the length of the top surface;

(f) one of the jaw structures defining a first jaw mounting surface facing toward the other of the jaw structures;

(g) the other of the jaw structures including:

(i) a first component operably engaged by the first clamping means and adapted to be secured by the first clamping means at a first selected position along the length of the top surface;

(ii) a second component movably connected to the first component for relative movement in directions toward and away from said one jaw structure;

(iii) fluid-operated actuator means interposed between the first and second components for moving the second component relative to the first component in a direction toward said one jaw structure; and,

(iv) biasing means interposed between the first and second components for biasing the second component toward the first component in a direction away from said first jaw structure;

(h) the second component defining a second jaw mounting surface facing toward the first jaw mounting surface;

(i) first and second jaw means carried, respectively, by the first and second jaw structures and being configured to clampingly engage workpiece means therebetween when the second component is moved toward said first jaw structure under the influence of the fluid-operated actuator;

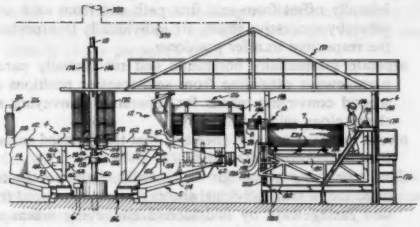
(j) the first jaw means abuttingly engaging the first jaw mounting surface, and the second jaw means abuttingly engaging the second jaw mounting surface; and,

(k) interfitting formation means being provided on the first jaw means and the first jaw mounting surface, and on the second jaw means and the second jaw mounting surface, for releasably mounting the jaw means on their respective jaw mounting surfaces and for accurately positioning the jaw means relative to their respective jaw mounting surfaces.

4,191,368
APPARATUS FOR FEEDING THIN SHEETS

Byron B. Brookhyser, Milton, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Mar. 20, 1978, Ser. No. 888,458
Int. Cl.² B65H *1/08*
U.S. Cl. 271—10 **6 Claims**



1. In a work station of the type having a plurality of vertically spaced substantially horizontal openings for the insertion therein of substantially flat thin sheet workpieces and an associated loading apparatus for sequentially feeding sheets into the openings, comprising:

a frame spaced adjacent the infeed side of the work station;

means for pivotally mounting the frame about a laterally extending axis positioned toward the rear of the frame and at a vertical location approximately midway between the uppermost and lowermost openings;

means on the floor of the frame for supporting a quantity of stacked sheets and for adjusting the vertical height of the top sheet;

a feeder mechanism located along the front side of the frame and elevated from the floor,

said feeder mechanism having a plurality of feed rolls forming at least one nip into which the top sheet of the stack will be fed; and

means for indexing the frame upwardly and downwardly so the nip of the feed rolls sequentially comes into alignment with each opening of the work station.

4,191,369
MEANS FOR GUIDING SHEET-LIKE PRINTING PAPER

Genji Matsuda, and Fumio Hosobuchi, both of Tokyo, Japan, assignors to Oriental Photo Industrial Co., Ltd., Tokyo, Japan

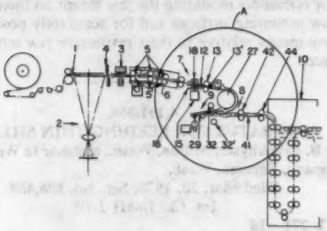
Filed May 26, 1978, Ser. No. 909,923
Claims priority, application Japan, Jun. 1, 1977, 52-64426
Int. Cl.² B65H *29/58*
U.S. Cl. 271—299 **7 Claims**

1. Apparatus for conveying and guiding exposed strip-form photographic printing paper into an automatic photographic

developing machine, said strip-form photographic printing paper having a downwardly facing exposed surface, comprising:

means for cutting the exposed strip-form photographic printing paper into sheets;

sorting means and first conveying means for conveying said sheets in single file along a first path to said sorting means, said sorting means comprising reciprocable means for receiving sheets from said first conveying means, means mounting said reciprocable means for reciprocable movement back and forth in a direction extending at a right angle to said first path, said reciprocable means being movable between at least two transfer positions which are



laterally offset from said first path and from each other whereby successive sheets are individually transported to the respective transfer positions;

separate substantially horizontal and substantially parallel passageways extending from said transfer positions and second conveying means for separately conveying said sheets along said passageways;

means for inverting said sheets so that the exposed surfaces thereof face upwardly; and

third conveying means for sequentially changing the feed direction of said individual sheets that are conveyed from said passageways by said second conveying means and then conveying said sheets into said automatic developing machine.

4,191,370

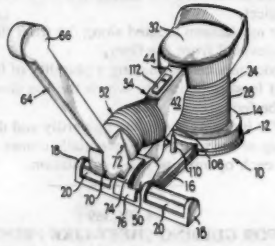
PNEUMATIC EXERCISING DEVICE

Burton C. Meyer, Downers Grove; Ralph J. Kulesza, and Alex Imatt, both of Chicago, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Nov. 25, 1977, Ser. No. 855,027

Int. Cl.[2] A63B *21/00*

U.S. Cl. 272—120 **12 Claims**



1. A self-energizing exercising device utilizing the weight of the user as a resistive force, comprising:

a base structure;

a seat means for supporting the user mounted for movement between different generally vertical levels above said base structure;

a flexible bellows type fluid chamber supporting said seat means on said base structure expandable and contractable to raise and lower the level of said seat means;

bellows pump means for supplying pressurized fluid to expand said fluid chamber and actuable by a user while seated on said seat means;

means for releasing pressurized fluid from said fluid chamber to lower the seat means from a selected upper position; and

handle means operable in generally a rowing fashion by a user positioned on the seat means for operating the pump means including a hand graspable portion mounted for movement toward and away from the seat means so as to require substantial movement of the user's arms and torso.

4,191,371

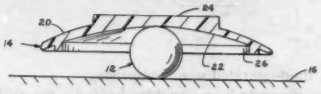
BALANCING APPARATUS

Leon Armer, Jr., 22 Utica St., Brockport, N.Y. 14420

Filed Jan. 16, 1978, Ser. No. 869,651

Int. Cl.[2] A63B *23/04*

U.S. Cl. 272—111 **5 Claims**



1. Balancing apparatus for providing recreational amusement and beneficial exercise to the user, said apparatus comprising:

a spherical fulcrum of a first diameter, said spherical fulcrum being rotatable about its orthogonal axes to freely move over a horizontal surface;

a platform supported by said spherical fulcrum and movable relative to said spherical fulcrum in a plurality of directions in the plane of the platform, said platform having a first surface and an oppositely facing second surface engaging said spherical fulcrum;

a foot support centrally located on said first surface; and

stop means for engaging said spherical fulcrum to limit movement of said platform for all directions of movement of said platform relative to said spherical fulcrum, said stop means being positioned on said second surface at a location outside the projection of said foot support from said first surface on said second surface.

4,191,372

TENNIS TRAINER DEVICE

Dennis H. Keller, 3437 Witt Rd., Auburn, Calif. 95604

Filed Mar. 24, 1978, Ser. No. 889,739

Int. Cl.[2] A63B *69/38*

U.S. Cl. 273—29 A **8 Claims**

8. A sport training device to improve a player's ability to hit a ball comprising:

a substantially vertical standard;

a cross arm, one end attached to an elevated portion of said standard;

a cord, one end of said cord connected to the other end of said cross arm;

fastening means attached to the other end of said cord and releasably attaching a ball to said cord, a said ball being released upon impact; of said ball by a striking implement; and

an elongated stiffening member attached to a length of said cord at a distance above said fastening means for decreasing the tendency of said cord to wrap around said cross arm after said ball is hit;

wherein said elongated stiffening member comprises a member having a weight of at least three/quarters of the total weight of the cord, the fastening means and said elongated stiffening member.

4,191,373

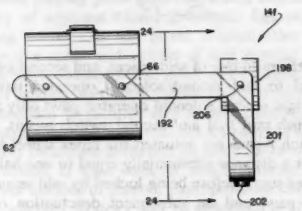
TENNIS ELBOW BRACE

William E. Lancellotti, 371 Broadway, Providence, R.I. 02903

Filed Dec. 6, 1976, Ser. No. 748,111

Int. Cl.² A63B *69/38*

U.S. Cl. 273—29 A **14 Claims**



12. A device adapted for wear by a tennis player for minimizing and/or perventing tennis elbow comprising, a pair of elements adapted for respective generally compressive contact with the area of said player's arm adjacent the medial and lateral condyles thereof, bracket means terminating in laterally spaced free ends and positioned generally beneath the wearer's elbow with said free ends thereof proximal said condyles when said device is properly worn by a person, said elements respectively mounted on said bracket means proximal said free ends in spaced opposition to each other, said bracket means permitting the adjustment of each of said elements so as to enable said elements to apply pressure to specific areas of said player's arm so as to relieve at least some of the tension applied to said condyles normally caused by the movements of said player's arm during tennis play, said device including forearm brace means extending forwardly from opposite sides of said bracket to anchor means adapted for connection to the forearm of the wearer, said anchor means including at least an upper forearm strap adapted for positioning proximal the wearer's elbow, said forearm brace means including separate first and second relatively stiff brace members connected respectively to the lateral and medial sides of said bracket and to generally opposite sides of said forearm strap.

4,191,374

PROJECTILE RETURN APPARATUS WITH BALL TARGET AREA

Ralph J. Kulesza, Chicago; John R. Wildman, North Riverside; Joseph M. Burck, Glenview; Burton C. Meyer, Downers Grove, and Walter J. Wozniak, Addisoa, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 10, 1978, Ser. No. 876,410

Int. Cl.² A63B *63/00*

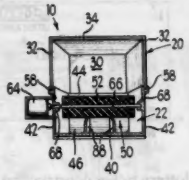
U.S. Cl. 273—30 **8 Claims**

1. A game apparatus for receiving and launching aerial projectiles such as a ball without substantially reducing the velocity of the projectile, comprising:

a self-contained portable housing having a generally open vertical ball receiving area;

a smaller, ball target area mounted at the rear of said housing behind said ball receiving area and having a width several times the diameter of a ball for receiving a ball propelled through the ball receiving area;

a ball propelling means including a rotating cylinder mounted adjacent the target area and a concentric arcuate housing portion spaced from the surface of said cylinder at a distance less than the diameter of said ball;



a ball ejection opening below the ball receiving area; and

guide means between said propelling means and said ejection opening for affecting the direction of a ball propelled by said propelling means, said guide means comprising a plurality of diverging dividers between the ball propelling means and ball ejection opening to define a plurality of exit paths of travel and movable means for varying the altitude of the propelled ball.

4,191,375

GAME BALL AND METHOD OF MAKING SAME

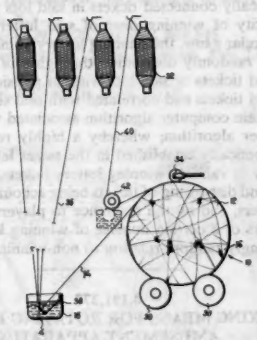
Vladimir Uruba, and Zdenek Figalla, both of Gottwaldov, Czechoslovakia, assignors to GALA, narodni podnik, Prostejov-Kraslice, Czechoslovakia

Filed Apr. 11, 1978, Ser. No. 895,370

Claims priority, application Czechoslovakia, Apr. 13, 1977, 2407/77

Int. Cl.² A63B *41/10, 45/00*

U.S. Cl. 273—65 EB **7 Claims**

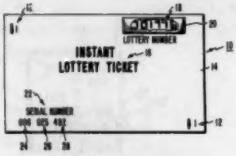


1. A method of making a game ball having an inner rubber bladder comprising the steps of simultaneously winding about said bladder a plurality of yarns in at least one layer, at least one of said yarns being formed of a substantially continuous strand of synthetic material and at least one of said yarns being formed of a substantially continuous strand of natural material, applying to said at least one strand of synthetic material along a major portion thereof an adhesive, prior to its winding on said bladder.

4,191,376
HIGHLY SECURE PLAYING CARDS FOR INSTANT LOTTERY AND GAMES

Max Goldman, and Carl Alexoff, both of Cherry Hill, N.J., assignors to Systems Operations, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 580,604, May 27, 1975, abandoned. This application Jan. 28, 1977, Ser. No. 763,639
Int. Cl.[2] A63B *71/06*
U.S. Cl. 273—139 **6 Claims**



1. An instant lottery ticket construction for a game comprising:

a plurality of lots of tickets, each of said tickets being imprinted with a serial number, and imprinted with a lottery number seemingly randomly associated with the serial number, said lottery number being not discernible after the ticket is fabricated and when given to the player being transformable by the player to be intelligible for comparison with known winning lottery numbers set forth in the game in association with the tickets when dispensed to the player, the tickets for each of said lots being physically connected and disconnected when dispensed to the player;

said serial numbers being imprinted by means of a computer-controlled printer on successive ones of said lottery tickets with said serial numbers being sequential within each of said lots and providing an inventory control of the tickets in each of said lots;

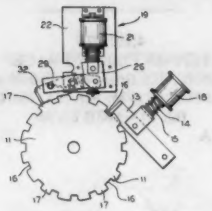
said lottery numbers being imprinted by means of said printer on said lottery tickets with each of said lottery numbers being correlated seemingly randomly to the serial number of the same ticket by a certain computer algorithm of logical operations so that improperly altered or counterfeit lottery numbers can be detected by testing for correlation with the associated serial number; said physically connected tickets in said lots having a certain quantity of winning ones of said lottery numbers in a particular game, the winning lottery numbers being seemingly randomly distributed through said physically connected tickets of said lots without physical manipulation of said tickets and correlated with said serial numbers by a certain computer algorithm associated with said lottery number algorithm; whereby a highly reliable lottery is economically established in the ticket fabrication by the ability to validate winning lottery tickets, by the distribution and dispensing of tickets being accounted for by serial numbers, and by the assurance to players and ticket dispensers of a certain number of winning lottery tickets in seemingly random relation to non-winning tickets.

4,191,377
INDEXING MEANS FOR ROTATING DRUMS OF AMUSEMENT APPARATUS

Walter M. Burnside, Waukegan, Ill., assignor to Bally Manufacturing Corporation, Chicago, Ill.

Filed Apr. 3, 1978, Ser. No. 892,671
Int. Cl.[2] A63F *5/04*
U.S. Cl. 273—143 R **3 Claims**

1. In an amusement apparatus including a plurality of rotatable drums, each having a plurality of symbols and each symbol being related to an index position on an index wheel connected to the drum, said index wheel having uniformly spaced peripheral teeth and spaces between said teeth, certain combinations of said symbols entitling a player to a reward, a clutch in driving engagement with one drum, a motor for driving said one drum through said clutch, a first solenoid operated pawl having its distal end normally biased into engagement in a space on said index wheel of said one drum to lock said index wheel against rotation, and first switch means for energizing upon actuation said first solenoid operated pawl, the improvement which comprises a second solenoid operated pawl having its distal end normally biased out of engagement with the periphery of said index wheel of said one drum but in registration with a point disposed substantially medially of one of said teeth when the distal end of said first solenoid operated pawl is

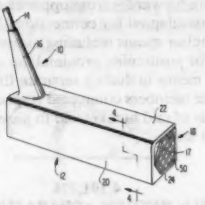


in engagement in one of said spaces, and second switch means connected to said second solenoid operated pawl so as to energize said second solenoid operated pawl only upon actuation of both said first and second switch means, whereby if both switch means are actuated the index wheel is driven by the motor a distance substantially equal to one-half the width of an index tooth before being locked by said second solenoid operated pawl and on subsequent deactuation of said first switch means the index wheel is driven by said motor an additional distance substantially equal to one-half of the width of an index tooth before being locked by said first solenoid operated pawl so that the total advance is one index position.

4,191,378
GOLF PUTTER WITH DETACHABLE MAGNETIC TAPE PLAYER CARTRIDGE

Wilfred F. Morin, 1560 Palisade Dr.; Joseph A. Martini, 655 Plumas, Suite 171, both of Reno, Nev. 89509; Peter Marich, and Harvey A. Gross, both of P.O. Box 2186, Reno, Nev. 89505

Filed May 2, 1978, Ser. No. 902,140
Int. Cl.[2] A63B *53/00, 53/04*
U.S. Cl. 273—162 R **8 Claims**



1. In a golf putter comprising an elongated golf head and a shaft mounted to the head and projecting upwardly therefrom, the improvement wherein said elongated golf head is C-shaped in vertical cross-section, including at least top and bottom walls joined by a sidewall and having an opposite sidewall open to define a side opening cavity, and said putter further comprises a unitary magnetic tape player cartridge, said cartridge comprising a rectangular casing which is generally configured and dimensioned to the cavity of said C-shaped elongated golf head and being insertably mounted within said cavity through said opening.

4,191,379

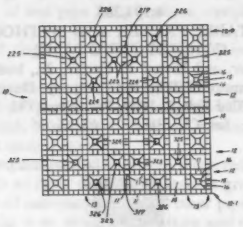
BOARD GAME

Louis DaVia, 16235 ½, Paramount, Calif. 90723

Filed Jun. 16, 1977, Ser. No. 807,224

Int. Cl.² A63F 3/00

U.S. Cl. 273—258 **7 Claims**



1. A game comprising a playing board having a flat surface with a multiplicity of discrete playing piece positions thereon arranged in a plurality of rows and a plurality of columns of distinctive colored playing piece positions which intersect to form a plurality of adjacent closed geometric figures, said figures enclosing portions of said board colored other than with said distinctive color, and certain of said playing piece positions at the intersections of said rows and columns have diagonal indicia leading therefrom, there being at least one playing piece position on each of said diagonal indicia, said distinctive colored playing piece positions thereby defining a grid of alternative rectilinear paths and diagonal paths of playing piece movement, at least some of said rectilinear paths having a different number of playing piece positions than said diagonal paths whereby strategy may be employed in alternatively selecting a path amongst said rectilinear and diagonal paths, a plurality of playing pieces for each of a plural number of players, and indicia means associated with each of said playing pieces specifying an exact value number of units of movement which a piece may cause by progression along said paths and by transfer to an adjacent confronting piece in a direction determined by the alignment of said movement causing piece and said confronting piece whereby ones of said playing pieces are adapted for movement by each player in rotation in said paths according to the value number associated with a selected piece which is moved until confronted with another playing piece blocking the path of movement of said selected piece so that the excess of the balance of said value number associated with said selected playing piece over the number of units theretofore moved by said selected playing piece in the current turn in reaching said confronting playing piece is imparted to said confronting playing piece to move the confronting playing piece in a direction of alignment of said selected piece and said confronting piece in lieu of said selected piece, a number of positions equal to the aforesaid balance.

4,191,380

VIDEO DISC PLAYER HAVING UNITARY RECORD HANDLING PLATFORM CONSTRUCTION

James A. Allen, Monrovia, and Leslie A. Torrington, Indianapolis, both of Ind., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 29, 1978, Ser. No. 964,537

Claims priority, application United Kingdom, Feb. 13, 1978, 5736/78

Int. Cl.² G11B 3/36

U.S. Cl. 274—9 B **4 Claims**

1. A player for use with a disc record removably subject to occupancy of a protective caddy; said player comprising:

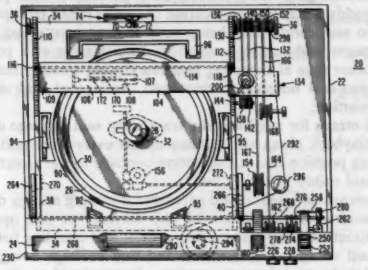
(A) a housing having an input slot into which a caddy is inserted;

(B) means for guiding caddy insertion into said housing along a path;

(C) a turntable for centering and rotatably supporting a record;

(D) means for removing a record from a caddy during caddy withdrawal subsequent to arrival of a record-carrying caddy at a fully inserted position in said housing, whereby a record is retained in said housing upon conclusion of such caddy withdrawal;

(E) a platform mounted in said housing subject to motion between an elevated position and a depressed position (1) for supporting a retained record while occupying said elevated position, and (2) for effecting transfer of said retained record to said turntable during its motion toward said depressed position;



(F) a signal pickup for recovering prerecorded information from a turntable-supported record during playback;

(G) a carriage for supporting said signal pickup;

(H) means for guiding said carriage in said housing along a second path lying parallel to said path of caddy insertion;

(I) means coupled to said carriage for selectively translating said carriage during playback along said guiding means away from a starting position in correlation with the rotation of said turntable; and

(J) means for fixedly mounting said caddy guiding means and said carriage guiding means on said movable platform.

4,191,381

APPARATUS FOR FACILITATING CARRIAGE RETURN IN VIDEO DISC PLAYER

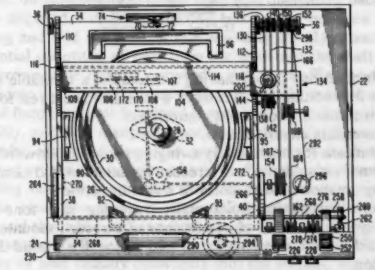
Frederick R. Stave, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 29, 1978, Ser. No. 964,535

Claims priority, application United Kingdom, Feb. 13, 1978, 5733/78

Int. Cl.² G11B 3/36, 17/04

U.S. Cl. 274—9 B **3 Claims**



1. A player for use with a record caddy; said player comprising:

(A) a housing having an input slot into which a caddy is inserted along a path;

(B) a record extracting mechanism for removing an enclosed

record from said caddy during withdrawal thereof subsequent to an occupied caddy arrival at a fully inserted position in said housing, thereby retaining the record in said housing for playback; wherein an empty caddy is inserted into said housing subsequent to playback to retrieve a retained record from said player;

(C) a turntable mounted in said housing for centering and supporting a retained record;

(D) means mounted in said housing for rotating said turntable;

(E) a signal pickup for recovering prerecorded information from a turntable-supported record during playback;

(F) a carriage for supporting said signal pickup;

(G) means for guiding said carriage in said housing along a second path lying substantially parallel to said path of caddy insertion; the location of said carriage path relative to said caddy path being such that an empty caddy engages said carriage, when said carriage is at a position other than at a starting position, during a caddy insertion into said housing to reset said carriage at said starting position;

(H) means for mechanically translating said carriage during playback along said guiding means away from said starting position and in a direction opposite to the direction of said caddy insertion; and

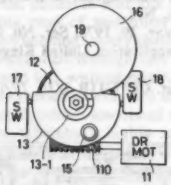
(I) means coupled to said carriage for storing energy during mechanical translation of said carriage in said opposite direction along said guiding means; said coupling between said energy storing means and said carriage being such that the stored energy applies a force to said carriage in a sense urging its travel along said guiding means in said direction of caddy insertion, whereby said applied force aids resetting of said carriage by an empty caddy to said starting position when said carriage is at a position other than at said starting position during a caddy insertion.

4,191,382

TURNTABLE ROTATION CONTROL DEVICE

Shizuo Inaba, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 19, 1978, Ser. No. 943,835
Claims priority, application Japan, Sep. 20, 1977, 52-112937
Int. Cl.[2] G11B *17/06*
U.S. Cl. 274—15 R **10 Claims**



1. In a record player having a turntable, a turntable drive motor for rotating said turntable, a tone arm and a rest for the tone arm, the improvement comprising:

a reversible electric motor,

first means for horizontally swinging a tone arm towards the inner circumference of a record mounted on said turntable by rotation of said motor in a first direction;

second means for horizontally swinging said tone arm toward the outer circumference of a record mounted on said turntable by rotation of said motor in a second direction;

means for generating signals to effectuate rotation of said motor in said first and second directions,

means for detecting when said tone arm has been swung horizontally from an initial position on said rest and generating an output signal thereof,

circuit means for producing a logical sum of an output signal of said signal generating means to drive said motor in said first direction and an output signal of said detecting means; and

a drive circuit driven in response to the logical sum output of said circuit means to control rotation of the turntable.

4,191,383

INFLATABLE PACKER AND METHOD OF CONSTRUCTING SAME

Eugene E. Baker, and Ernest E. Carter, Jr., both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Feb. 2, 1979, Ser. No. 8,773
Int. Cl.[2] F16J *15/40, 15/46*
U.S. Cl. 277—1 **18 Claims**

1. An inflatable packer element, comprising:

an inflatable bladder means including a reinforcing element;

an annular anchor means having an axially tapered surface;

an annular wedge means having an axially tapered surface,

said bladder means, anchor means and wedge means being so arranged that an end of said reinforcing element is located between said tapered surfaces of said anchor means and said wedge means; and

means for applying hydraulic pressure to said wedge means to urge said tapered surface of said wedge means toward said tapered surface of said anchor means so that said end of said reinforcing element is clamped between said tapered surfaces.

4,191,384

METHOD AND DEVICE FOR SEALING A PIPE JOINT

Lennart Svedberg, Bredaryd, Sweden, assignor to Forsheda Gummifabrik AB, Forsheda, Sweden

Filed Apr. 3, 1978, Ser. No. 893,038
Int. Cl.[2] F16J *15/06*; B23Q *3/00*
U.S. Cl. 277—1 **4 Claims**

1. The method of placing in correct position the annular sealing lip of an elastomeric sealing ring when assembling a

pipe joint by inserting one end of an inner pipe into one end of an outer pipe, said completed pipe joint comprising said elastomeric sealing ring seated in a circumferential inner channel in said outer pipe, said annular sealing lip protruding obliquely inwardly and against the direction of insertion of said inner pipe for making a seal between said inner and outer pipes when said assembly of said pipe joint has been completed, comprising:

placing said ring in said channel prior to insertion of said inner pipe;

inserting into the central opening of said annular sealing lip a radially-expandable generally-cylindrical mounting guide which, upon insertion thereof, is of smaller diameter than said central opening;

thereafter expanding said mounting guide radially to stretch said lip to an inner diameter at least as great as the outer diameter of said one end of said inner pipe;

while said lip is so stretched, inserting said one end of said pipe through the interior of said mounting guide to a position within said opening in said stretched lip; and

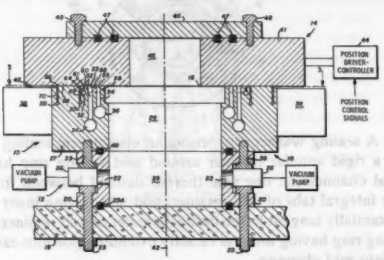
thereafter withdrawing said mounting guide and permitting its said lip to contract and bear against the outside surface of said end portion of said inner pipe.

4,191,385

VACUUM-SEALED GAS-BEARING ASSEMBLY

Wayne L. Fox, deceased, late of Castro Valley, Calif., and by Rosemary M. Fox, executrix, 5640 Cold Water Dr., Castro Valley, Calif. 94546

Filed May 15, 1979, Ser. No. 39,307
Int. Cl.[2] B01J *17/00*; B16J *15/40*
U.S. Cl. 277—3 **10 Claims**



1. An integral vacuum sealed gas-bearing housing assembly comprising, in combination:

a first sub-assembly housing means establishing a first internal chamber, said first sub-assembly having a first planar surface about the periphery of said first chamber and a plurality of vacuum plenums delineated by adjacent lands and extending to said planar surface;

a plurality of individual plenum ducts connected to said plenums;

manifold means for interconnecting said plenum ducts to vacuum pump means;

at least one gas-bearing means within said first sub-assembly about said first planar surface and extending about the perimeter of the chamber and spaced laterally from said plenums;

at least one gas duct within the side wall of said first housing and interconnected to the gas-bearing means;

manifold means for interconnecting the gas duct to a gas pump means to pump gas therein at a pressure above atmospheric pressure;

a second sub-assembly housing means forming a second internal chamber communicating with said first internal chamber, said second sub-assembly housing means having a second planar surface, said second planar surface being in face-to-face orientation with said first planar surface and overlapping said individual plenums and said gas-bearing groove; and

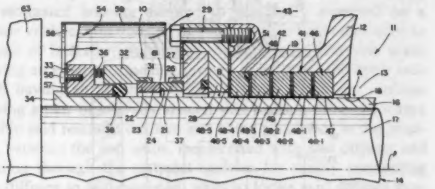
driver means for moving said second sub-assembly housing means relative to said first sub-assembly housing means whereby gas pumped within said gas duct establishes a gas bearing about the interface of said first and second planar surfaces to establish a spacing intermediate the first and second sub-assemblies and said vacuum pump means removes gas from said interface intermediate the gas-bearing means and said internal chambers.

4,191,386

SELF-COOLED MECHANICAL SEAL

Lowell E. Hershey, Portage, Mich., assignor to Durametallic Corporation, Kalamazoo, Mich.

Filed Jan. 16, 1978, Ser. No. 870,006
Int. Cl.[2] F16J *15/34*
U.S. Cl. 277—22 **8 Claims**



1. In a seal construction for creating a sealed relationship between a wall of a fluid handling device for use with a high-temperature fluid and a rotatable shaft projecting outwardly of the wall through an opening formed therein, the fluid handling device defining therein a fluid chamber in communication with the opening, said wall having an axially elongated sleevelike stuffing box fixedly related thereto in concentric and surrounding relationship to said shaft so that the interior of said stuffing box communicates with said opening, and a mechanical seal assembly positioned adjacent the free end of the stuffing box and disposed in surrounding relationship to the shaft for creating a sealed relationship therebetween to prevent escape of fluid from said device, said mechanical seal assembly including first and second seal ring means disposed in axially opposed relationship, first mounting means for nonrotatably connecting said first seal ring means with respect to said stuffing box, second mounting means for nonrotatably connecting said second seal ring means with respect to said shaft, said first and second seal ring means respectively having first and second annular axially directed seal faces formed thereon and disposed in relatively rotatable sliding sealing engagement with one another, the improvement comprising heat dissipating packing means disposed within the stuffing box axially between said opening and said mechanical seal assembly for (1) extracting substantial quantities of heat from the fluid and the shaft and transferring same radially outwardly into the stuffing box and thence into the surrounding environment and (2) restricting the flow of fluid therepast from said device to said mechanical seal assembly, said heat dissipating packing means being formed as an axially elongated sleevelike packing structure stationarily mounted within the interior of said stuffing box in close surrounding relationship to said shaft so as to define a narrow annular clearance space in surrounding relationship to said shaft, said sleevelike packing structure having a relatively high heat transfer coefficient in the radial direction to facilitate the transfer of heat radially outwardly into the stuffing box while having a low heat transfer coefficient in the axial direction to prevent heat transfer axially therealong toward the mechanical seal assembly, said packing structure including a plurality of axially aligned packing rings positioned within said stuffing box in surrounding relationship to said shaft and a plurality of thermal insulator rings disposed in axial alignment with said packing rings, said packing rings being constructed of a mate-

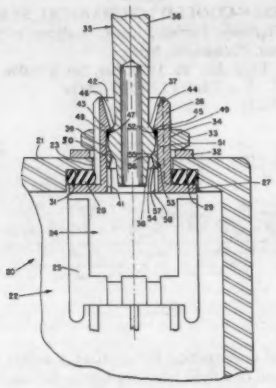
rial having a high heat transfer coefficient, and said insulator rings being axially spaced apart and positioned axially between adjacent packing rings for preventing heat transfer axially between adjacent packing rings.

4,191,387

WATERTIGHT SEAL FOR TOGGLE SWITCHES

Francis D. Kirchoff, Waban, Mass., assignor to Alco Electronic Products, Inc., North Andover, Mass.

Filed Dec. 21, 1978, Ser. No. 971,801
Int. Cl.[2] H01H *3/06*; F16J *15/18*
U.S. Cl. 277—30 **10 Claims**



1. A watertight seal for a toggle switch of the type having an elongated, toggle switch handle with an integral, generally spherical, portion of predetermined diameter, intermediate of the length thereof said seal comprising:

an elongated hollow housing having an open upper end, an open lower end, an annular, inward-projecting shoulder, intermediate of said ends, of less diameter than said spherical portion and a cylindrical recess of greater diameter than said spherical portion extending from said open, lower end to said shoulder;

said spherical portion having an outer circumferential face in sliding contact with said annular shoulder;

a first annular seal, of flexible resilient material, seated within said cylindrical recess and juxtaposed to said shoulder said seal being in sliding contact with the outer circumferential face of said spherical portion and

a second annular seal, of flexible resilient material, mounted within said cylindrical recess, and in sliding contact with the inner circumferential face of said spherical portion;

said first and second annular seals permitting actuation of said toggle handle while preventing passage of moisture around said handle.

4,191,388

TAIL GATE STEP

Lester T. Barksdale, P.O. Box 729, Tavares, Fla. 32778

Filed Jun. 1, 1978, Ser. No. 911,336
Int. Cl.[2] B60R *3/02*
U.S. Cl. 280—166 **10 Claims**

1. In combination:

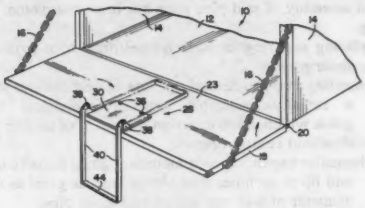
a vehicle having a foldable panel pivoted by a hinge to a portion of the vehicle, said panel having holes therein;

a plate mounted against said panel, said panel including a pair of sheets with a void therebetween, said holes extending through one of said sheets;

means extending through said holes for removably coupling said plate with said panel;

a step; and

means for pivotably coupling said step with said support member such that said step may be pivoted to a stepping position below said panel when said panel is in the horizontal position, said coupling means including a pair of rods, each rod having a first leg and a second leg substantially normal to said first leg, said first leg coupled substantially normal to said plate and extending through one of said holes, and wherein said second leg extends substantially parallel with said sheet and through said void.

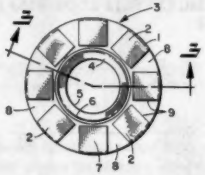


4,191,389

SEALING WASHER

Jerry G. Jelinek, La Habra, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Oct. 26, 1977, Ser. No. 845,640
Int. Cl.[2] F16K *41/00*; F16J *9/06*
U.S. Cl. 277—166 **8 Claims**



1. A sealing washer comprising an elastomeric sealing ring; and a rigid annular retainer around said sealing ring having radial channels on one side thereof defined between folded-over integral tabs of said retainer, said tabs having inner ends substantially tangent to the inside diameter of said retainer; said sealing ring having integral radially extending portions extending into said channels.

4,191,390

GASKET RING WITH LOCKING RINGS

Franz-Josef Wolf, Bad Soden-Salmunster, and Dieter Roth, Schluchtern-Kressenbach, both of Fed. Rep. of Germany, assignors to WOCO Franz-Josef Wolf & Co., Bad Soden-Salmunster, Fed. Rep. of Germany

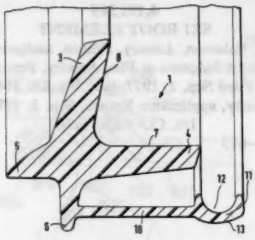
Filed Sep. 18, 1978, Ser. No. 943,230
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1977, 2743238; Dec. 9, 1977, 2754982
Int. Cl.[2] F16J *15/10*
U.S. Cl. 277—219 **8 Claims**

1. A sealing ring assembly including:

a sealing ring of elastic material adapted for insertion in a pipe element, said sealing ring having a contoured annular retaining ring with a concave opening facing radially inwardly with respect to said sealing ring, said retaining ring being adapted to engage an annular groove in a pipe to secure said sealing ring against axial displacement; and

a clamping ring for engagement with said retaining ring, said clamping ring being a split ring the major portion of which is U-shaped in cross section, said clamping ring having overlapping ends, one of said overlapping ends being reduced in size to fit within and engage the other of

said overlapping ends to form a substantially uninterrupted circular path, said clamping ring being radially



expandable, and said clamping ring including locking means to prevent radial contraction of said clamping ring.

4,191,391

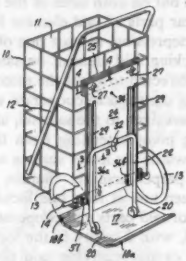
SHOPPING CART WITH AUXILIARY SLED ATTACHMENT

Peter J. Dorlini, 415 Gramatan Ave., Mt. Vernon, N.Y. 10552

Filed Sep. 1, 1978, Ser. No. 938,914

Int. Cl.[2] B62B *13/18*

U.S. Cl. 280—9 **8 Claims**



1. A shopping cart of basket-type construction having an open top for the reception of groceries and the like, a handle for pushing or pulling the same, and a pair of wheels at its bottom rear end for rolling ground engagement with a sidewalk, street and the like, characterized in that:

(a) said shopping cart has an auxiliary sled attachment including a sled which is movable into and out of one of two selective positions, wherein in one of said positions the sled of such attachment is in ground engaging position, and in the other of said positions is in an inoperative, non-ground engaging position;

(b) said auxiliary sled attachment has

a support plate secured to the back of the cart,

a slidably mounted inverted U-shape frame,

vertically slidable means on said U-shape frame cooperating with complemental means on said support plate, and

a pivotal connection between the free ends of the U-shape frame and said sled member, whereby said inverted U-shape frame may be moved upwardly and downwardly to bring said sled into and out of operative, ground engagement;

and

(c) means for retaining said sled in either of said selective positions.

4,191,392

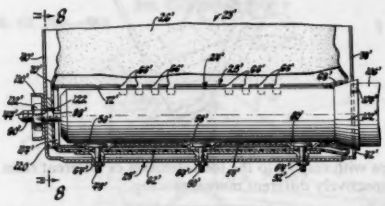
OCCUPANT RESTRAINT CUSHION SYSTEM

Ronald R. Barnett, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 24, 1978, Ser. No. 936,353

Int. Cl.[2] B62D *21/08*

U.S. Cl. 280—740 **2 Claims**



1. An occupant restraint system comprising, in combination, an elongated housing adapted to be fixedly mounted on a motor vehicle, said housing including a base wall connected to a pair of laterally spaced side walls, one of said side walls having an enlarged opening formed therein and the other side wall having an aperture formed therein, a restraint cushion having a pair of laterally spaced side walls, a diffuser located within said restraint cushion and being positioned in the housing between the end walls, means fixed with said diffuser and passing through the restraint cushion for rigidly connecting the diffuser to said base wall so as to locate said diffuser concentrically and in spaced relationship with respect to said enlarged opening in said one of said side walls of said housing, a gas generator having a body portion positioned in said diffuser and having a stud formed with one end thereof that extends through one of said side walls of said restraint cushion and through said aperture in said other side wall of said housing, an enlarged head formed with the other end of said body portion and extending out of the other of said side walls of the restraint cushion, a nut on the stud, said diffuser having a longitudinal length greater than the longitudinal length of said body portion with one end of said diffuser abutting a fixed portion of said one of said side walls of said housing and the other end abutting said enlarged head, the stud end of said body portion being spaced from said one of said side walls so as to form a chamber between said stud end of said body portion and the restraint cushion along said one of said side walls so that upon tightening of said nut on the stud the opposite ends of said diffuser cooperate with said one of said side walls of said housing and with said enlarged head respectively to provide a seal at each end of the diffuser, and a portion of said one end of said diffuser being spaced from said fixed portion of said one of said side walls of said housing so as to provide a vent for said chamber that prevents a pressure build-up therein.

4,191,393

BICYCLE LUGGAGE CARRIER ATTACHMENT ARRANGEMENT

Heinz Niemann, Herford, Fed. Rep. of Germany, assignor to ESGE-Marby GmbH & Co., Bielefeld, Fed. Rep. of Germany

Filed Dec. 7, 1978, Ser. No. 967,220

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1978, 7828291[U]

Int. Cl.[2] B62J *7/04, 11/00*

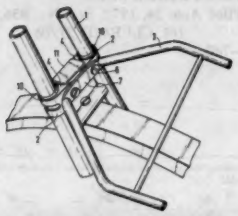
U.S. Cl. 280—289 A **10 Claims**

1. Attachment arrangement to attach a luggage carrier to the fork elements (1) of the rear fork of a bicycle frame, in which the carrier (3) has a cross bar (7) formed with screw holes therethrough, said arrangement comprising

two separate U-shaped clamps (2), each formed with elongated openings (5) in the legs (4) of the U for placement of the U-shaped clamps, individually, around the fork elements (1);

and threaded bolts (6) passing through said openings and

through the screw holes of the cross bar (7) of the carrier, the elongated openings permitting adjustment of the U-shaped



clamps with respect to the fork elements of different sizes and of respectively different mutual spacing.

4,191,394

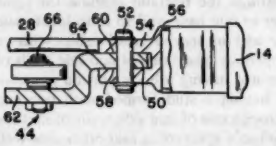
TRAILER HITCH

John T. Kasselmann, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jul. 3, 1978, Ser. No. 922,007

Int. Cl.[2] B62D *13/04*; B60T *7/20*

U.S. Cl. 280—432 **3 Claims**



1. In a tow vehicle-trailer combination having a steering system on the trailer that responds to a steering input signal created in the tow vehicle, a brake system on the trailer that responds to a braking input signal developed in a surge brake actuator, and a hitch for joining the tow vehicle to the trailer, the improvement in which the hitch includes, a connecting member pivotally attached to said tow vehicle, to said surge brake, and to said steering system, said connecting member comprising:

a bracket fixed to said tow vehicle having a first and second spaced apart pivotal point of attachment;

a clevis attached to an input member of said surge brake actuator;

a plate member having a hole therethrough, said hole being aligned with said clevis;

a pin extending through said hole for connecting said plate with said clevis, said clevis supporting said plate member in said trailer, said plate having third and fourth spaced apart pivotal points of attachment located on opposite sides of said hole;

a first bar attached to said bracket and said plate for connecting said first pivotal point of attachment with said third pivotal point of attachment; and

a second bar attached to said bracket and said plate for connecting said second pivotal point of attachment with said fourth pivotal point of attachment, said first and second bars transmitting both the braking input signal and the steering input signal from the tow vehicle to the plate member, said plate member pivoting with respect to said surge brake actuator for transmitting said steering input signal from the tow vehicle to the trailer and moving longitudinally with respect to the tow vehicle for transmitting said braking input into said surge brake actuator to effect a brake application, said first, second, third and fourth spaced apart pivotal points of attachment stabilizing the transmission of said braking input signal to said surge brake actuator to reduce the possibility of introducing a steering input into said steering system during a brake application.

4,191,395

SKI BOOT ELEMENT

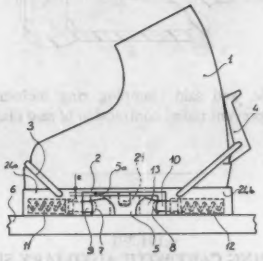
Georges P. J. Salomon, Annecy, France, assignor to Etablissements Francois Salomon et Fils, Annecy, France

Filed Sep. 2, 1977, Ser. No. 830,244

Claims priority, application France, Sep. 3, 1976, 76 26686

Int. Cl.[2] A63C *9/08*

U.S. Cl. 280—613 **15 Claims**



1. A ski-boot element attached at least temporarily to a boot during skiing and designed to be held to a ski, comprising

(a) a depression arranged substantially in the central area of said element and extending transversely under the skier's foot the open out on both sides of the said element;

(b) front and rear parts of said element located at opposed ends of said depression, at least one of said parts having means for locking said element on said ski, said locking means being directed towards the interior of said depression and being designed to cooperate with a corresponding locking part fixed to the said ski; and

(c) a projecting pivot extending from the bottom of said depression towards the lower surface of said element and substantially perpendicularly thereto, said pivot being located between said at least one locking means and the opposed one of said parts and cooperating, when said ski is being fitted, with a cavity in the locking part fixed to said ski, said cavity receiving said pivot in a rotatable relationship.

4,191,396

CROSS COUNTRY SKI BINDING

Peter Biermann, Warmbronn, and Otto Ewald, Griesheim, both of Fed. Rep. of Germany, assignors to Vereinigte Baubeschlagfabriken Gretsch and Company GmbH, Fed. Rep. of Germany

Filed Nov. 7, 1977, Ser. No. 849,447

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1976, 2650678

Int. Cl.[2] A63C *9/00*

U.S. Cl. 280—615 **29 Claims**

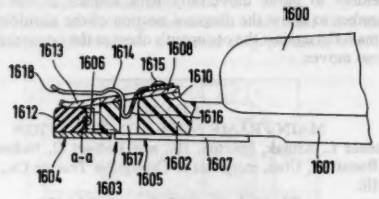
1. Cross country ski binding comprising:

forward ski boot support element means fixedly attachable to a ski, said support element means including means supportingly engageable with a forward sole extension of a ski boot while permitting lifting of the rear part of said ski boot from the ski,

and resiliently biased latching means for engaging said support element means with said forward sole extension to latch said sole extension to said ski,

wherein said support element means includes a front support element part which is fixedly attachable to said ski, a rear support element part engageable with a free end of said forward sole extension, in a manner which leaves a longi-

tudinal portion of the sole extension between said free end and a show portion of the ski boot unrestrained against lift-off from said rear support element part, and a connecting part connecting said front and rear support element parts for angular movement relative to one another, whereby ease of lifting the rear part of said ski boot is enhanced by said angular movement.



4,191,397

BABY CARRIAGE

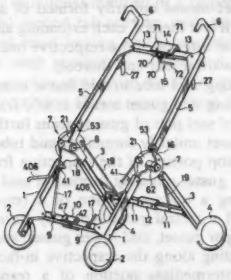
Kenzo Kassai, Osaka, Japan, assignor to Kassai Kabushikikaisha, Osaka, Japan

Filed May 4, 1978, Ser. No. 903,016

Claims priority, application Japan, Jun. 15, 1977, 52/71460; Dec. 22, 1977, 52/155189; Jan. 7, 1978, 53/596[U]; Jan. 27, 1978, 53/8443

Int. Cl.² B62B *11/00*

U.S. Cl. 280—647 12 Claims



1. A collapsible baby stroller, comprising frame means, hammock means operatively held in said frame means for resting a baby in said hammock means, said frame means comprising first and second leg means and push means, said frame means further comprising pivotal mounting means having a pivot axis, said pivotal mounting means being disposed on opposite sides of said hammock means, said pivotal mounting means operatively pivotally interconnecting said first and second leg means and said push means, at least one of said pivotal mounting means including fixed stop plate means having a circumferential surface with its center at said pivot axis, said circumferential surface of said stop plate means having at least two notches at different positions thereon; said stroller further comprising a wedge-like member operatively supported by said push means and movable toward and away from said stop plate means; whereby the selective engagement of said movable wedge-like member with either of said at least two notches enables said push means to be alternately fixed in two positions so that said push means are tilted forwardly of said hammock means in one of said two positions and rearwardly of said hammock means in the other of said two positions.

4,191,398

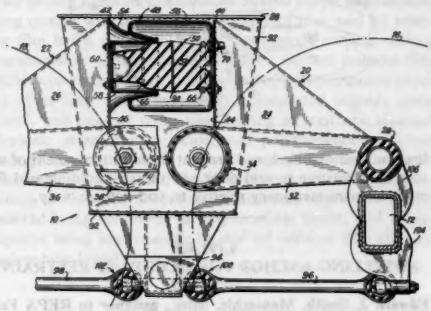
VEHICLE SUSPENSION SYSTEM

Elwood H. Willetts, 102 S. Penatsquit Ave., Bay Shore, N.Y. 11706

Continuation-in-part of Ser. No. 706,730, Jul. 19, 1976, Pat. No. 4,030,738, and Ser. No. 807,002, Jun. 16, 1977, Pat. No. 4,132,433. This application Oct. 28, 1977, Ser. No. 846,374

Int. Cl.² B60G *5/00*

U.S. Cl. 280—683 1 Claim



1. A multiple axle vehicle suspension structure, comprising, in combination: transversely extending axles spaced from one another longitudinally with respect to the longitudinal axis of said vehicle suspension structure, frame members spaced transversely with respect to one another and extending between said axles, opposing rocker beam assemblies separately trunnioned in said structure at an elevation beneath the elevation of said frame members, said opposing rocker beam assemblies being pivotally supported at longitudinally extending ends thereof by and above the respective elevations of said axles, multiple spring means characterized by the absence of helical springs and being reactive with respect to said axles for operationally equalizing the load as between said axles, said multiple spring means comprising an air spring assembly disposed intermediate and cooperative with upwardly extending faces of said opposing rocker beam assemblies, and at least one elastomer which is operatively resistant to compressive forces produced during use, said compressive resistant elastomer comprising an elastomeric member of high hysteresis characteristics and being operatively self-damping while in parallel relationship with respect to said air spring assembly, operationally providing a combined spring rate with said air spring assembly which increases progressively with load, said compressive resistant elastomer being enclosed within the confines of and during use functioning within the longitudinal space limitations as that of said air spring assembly.

4,191,399

VEHICLE OCCUPANT RESTRAINT SYSTEM

Louis P. Garvey, Birmingham, and Chester F. Rhamstine, Mt. Clemens, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

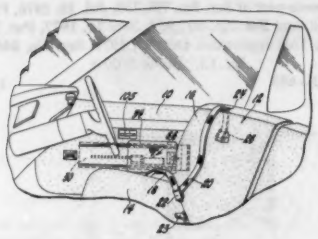
Filed May 18, 1978, Ser. No. 907,116

Int. Cl.² B60R *21/10*

U.S. Cl. 280—806 5 Claims

1. In a vehicle having a body with a side door pivotally movable between open and closed positions to facilitate entry and exit of a vehicle occupant, a seat for a vehicle occupant operatively mounted within said body adjacent to said door, said seat having a bench and a back disposed laterally of said door, a restraint belt for an occupant sitting in said seat, first anchor means operatively connected to one end of said belt and secured to said seat back, second anchor means operatively connected to said vehicle body disposed laterally from said door, said second anchor means including selectively engage-

able buckle means for connection with the other end of said belt, and interlock means for securing said seat back directly to said side door to lock said door under predetermined forward



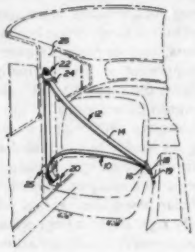
load on said seat back and prevent forward movement of said seat back relative to said door and thereby holding said first anchor means stationary relative to said vehicle body.

4,191,400

SWIVELING ANCHOR FOR OCCUPANT RESTRAINT SYSTEM

Edward J. Smith, Mantachie, Miss., assignor to REPA Feinstanzwerk GmbH, Fed. Rep. of Germany

Filed Mar. 25, 1977, Ser. No. 781,194
Int. Cl.[2] B60R *21/10*
U.S. Cl. 280—808 **1 Claim**



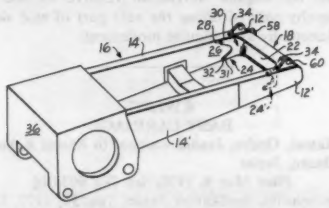
1. In a vehicle restraint system of the type in which a belt member extends upwardly from a first vehicle anchorage point to an upper vehicle anchorage point and then diagonally downwardly across the chest of a vehicle occupant to a lower anchorage point and where said first anchorage point comprises a belt retractor connected with said belt and having means urging said belt toward a retracted position, anchorage means at said upper anchorage point for engaging the belt member generally behind outwardly and above the occupant's outside shoulder for guiding the belt member over the occupant's shoulder and then diagonally downwardly toward said first anchorage point and for transmitting forces to the frame of the vehicle generally behind, outwardly of, and above the occupant's outside shoulder, said anchorage means comprising a ring member having an opening through which the belt member extends, an anchor member connected in force transmitting relationship with said ring member, said anchor member comprising a sheet metal member having a portion folded back upon itself to define first and second metal sheet portions with contiguous inner surface portions, said sheet metal member forming a loop surrounding a portion of said ring and being non-rotatably connected therewith, means for supporting said anchor member in force transmitting relationship with the frame of the vehicle comprising a bushing member fixedly connected with the frame of the vehicle, said bushing member having an outer surface portion forming a portion of a sphere, said inner surface portions of said first and second metal sheet portions of said anchor member extending generally outwardly and forming bearing surface means in the shape of a portion of a sphere disposed in surrounding relation with said outer surface portion of said bushing member for allowing said anchor member to move universally with respect to said bushing member to allow the diagonal portion of the shoulder belt to remain flat against the occupant's chest as the occupant's upper torso moves.

4,191,401

MAIN FRAME NOSE CONSTRUCTION

Ronald L. Krolak, Morton, Ill., and Delbert G. Nelson, West Bountiful, Utah, assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 18, 1977, Ser. No. 816,632
Int. Cl.[2] B62D *27/00*
U.S. Cl. 280—796 **11 Claims**



1. A nose construction for spanningly connecting the front ends of a pair of generally parallel linearly extending vehicle frame members, comprising:

a tube extending from the front end of one to the front end of the other of said pair of frame members;

a pair of gusset means unitarily formed of said tube, one adjacent each end thereof, each extending along an in-facing side of the exterior of the respective one of said frame members toward a rear end thereof;

means for affixing said tube to said frame members; and

means for affixing said gusset means to said frame members;

wherein each of said pair of gusset means further comprises an upper gusset unitarily formed of said tube and extending along a top portion of the respective frame member, and a lower gusset unitarily formed of said tube and extending along a bottom portion of a respective frame member, and a central gusset unitarily formed with said tube, said upper gusset, said lower gusset, and said central gusset extending along the respective in-facing side of a respective intermediate portion of a respective frame member; and

wherein each of said central gussets comprises an upper branch abutting a respective upper gusset, a lower branch abutting a respective lower gusset, and a central region terminating short of the rearward termination of both of said upper and lower branches.

4,191,402

FORM FOR CONTROL AND/OR RECORDING PURPOSES

Irving R. Michlin, Katonah, N.Y., assignor to Transkrit Corporation, Elmsford, N.Y.

Continuation of Ser. No. 706,198, Jul. 19, 1976, abandoned. This application Jul. 28, 1978, Ser. No. 928,779
Int. Cl.[2] B42F *3/00*
U.S. Cl. 282—23 R **12 Claims**

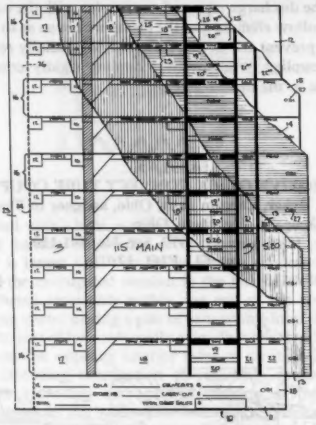
1. A form comprising

a face sheet having an ordered array of sets of designated spaces thereon for recording of information thereon;

a second sheet underlying said face sheet, said second sheet defining a plurality of separated strip portions, a first common tab portion secured to each of said strip portions, and a line of weakening between said tab portion and said

strip portions for individual removal of a respective strip portion from said tab portion, each said strip portion having a surface positioned under a respective set of designated spaces of said face sheet to simultaneously receive and record the information of a respective set of designated spaces thereon; and

a third sheet underlying said second sheet, said third sheet defining a plurality of separated strip portions, a second



common tab portion secured to each of said strip portions of said third sheet and a line of weakening between said second tab portion and said strip portions of said third sheet for individual removal of a respective strip portion from said second tab portion, each said strip portion of said third sheet having a surface positioned under a respective strip portion of said second sheet to simultaneously receive and record the information of said respective strip portion of said second sheet thereon.

4,191,403

DONOR MATERIAL FOR CARBONLESS COPYING

Guido Dessauer, Düsseldorf-Gerresheim; Kurt Riecke, Kempen, and Ferdinand Land, Viersen, all of Fed. Rep. of Germany, assignors to Feldmuhle Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Sep. 13, 1978, Ser. No. 941,801

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1977, 2743800

Int. Cl.[2] B41M *5/22*

U.S. Cl. 282—27.5 **5 Claims**

1. In a donor material for carbonless copying including a carrier sheet, a multiplicity of frangible microcapsules secured to one major face of said sheet, each microcapsule containing a dye precursor in a liquid medium, and discrete spacer particles interposed between said microcapsules and projecting beyond said microcapsules away from said face for protecting the microcapsules against premature fracture, the improvement which resides in said spacer particles consisting essentially of a vegetal protein insoluble in water and amounting to 10 to 50% of the weight of said microcapsules, the average size of said particles being between two and three times the average size of said microcapsules.

4,191,404

PROCESS FOR PRODUCING A PRESSURE-SENSITIVE CARBONLESS COPY SHEET USING MICROCAPSULES FORMED IN SITU IN A RADIATION CURABLE BINDER

Yu-Sun Lee, Parma, Ohio, and Dale R. Shackle, Scottsboro, Ala., assignors to The Mead Corporation, Dayton, Ohio

Division of Ser. No. 773,901, Mar. 3, 1977, abandoned. This application Apr. 7, 1978, Ser. No. 894,404

Int. Cl.[2] B41L *1/36*

U.S. Cl. 282—27.5 **2 Claims**

1. A pressure-sensitive carbonless paper comprising a substrate having a plurality of surfaces, at least one of said surfaces being coated with a set, tack-free resinous film, said set resinous film being compatible with the desired surface writing characteristics of said carbonless paper, said set resinous film further comprising a free radical initiated polymerization product of at least one ethylenically unsaturated organic compound, said organic compound having at least one terminal ethylenic group per molecule, said polymerization product having dispersed therein pressure-rupturable microcapsules containing a hydrophilic liquid, said hydrophilic liquid containing at least one chromogenic material, said chromogenic material being soluble in said hydrophilic liquid, said microcapsules being impermeable to said set resinous film and said hydrophilic liquid.

4,191,405

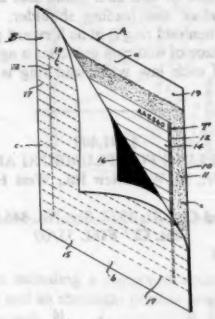
MARKER MANIFOLD

Dick E. Johnstun, 27472 Via Olmo, Mission Viejo, Calif. 92691

Filed Mar. 12, 1979, Ser. No. 19,907

Int. Cl.[2] B32B *1/08, 3/16;* B41L *1/16;* B41M *5/10*

U.S. Cl. 282—28 A **24 Claims**



1. A manifold embracing a heat shrink marker tube for imprinting, and including;

a flexible backing lamina of elongate sheet form and having at least one marginal portion,

a flexible marker tube of partially cured cross-linked polymer tubing hardened into a constrained flattened configuration and secured over the backing lamina by means of a releasible pressure sensitive adhesive,

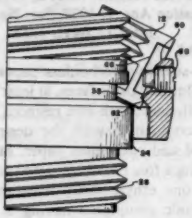
and a flexible carbon faced front lamina coextensively overlying the flattened marker tube and with at least one marginal portion overlying said at least one marginal portion of the backing lamina, and with the carbon facing the said marker tube,

the said at least one marginal portions of the laminae being releasably secured one to the other by pressure adhesive.

4,191,406
QUICK ACTING COUPLING

Edward M. Eaton, 3727 Valle Vista, Chino, Calif. 91710

Filed Sep. 5, 1978, Ser. No. 939,333
Int. Cl.[2] F16L 37/12
U.S. Cl. 285—35 6 Claims



1. A coupling for interconnecting a pair of tubular members:

(a) a body having a through opening and bearing attachment means at one end thereof permitting its removeable, fixed attachment to one of said pair of tubular members, and an annular groove at the opposite end thereof;

(b) an assembly of a plurality of closely spaced, segmented arcuate jaws having outer segmented circular surfaces, each having:

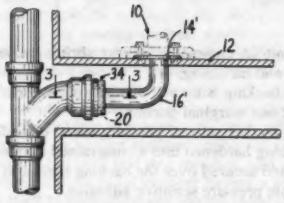
an inboard radial flange seated in said annular groove of said body to permit pivotal movement of said jaws between radially expanded and compressed positions, and a radial groove on the trailing portion of its outer surface with segmented conical leading and trailing shoulders; and

(c) a cam ring surrounding the assembly of said jaws and axially-slidable thereon between forward and rearward positions with a cylindrical inside wall and an interior cam guide intermediate its width and having a triangular cross-section with leading and trailing surfaces having the same incline as the respective leading and trailing shoulders of said jaws whereby said cylindrical inside wall and the leading surface of said cam guide seat against the outer circular surface and leading shoulder, respectively, of each jaw when said ring is in its forward position and said trailing surface of said cam guide seats against the trailing shoulder of each jaw when said ring is in its rearward position.

4,191,407
PIPE COUPLING FOR PLUMBING APPARATUS

John Bretone, Jr., 91 Woodview Rd., West Hempstead, N.Y. 11552

Filed Oct. 31, 1977, Ser. No. 846,971
Int. Cl.[2] F16L 55/00
U.S. Cl. 285—56 8 Claims



1. Apparatus for connecting a discharge pipe between a toilet to be supported on a floor and a section of a sewage system, the apparatus comprising:

a ferrule, having one end sealed to the section of the sewage system;

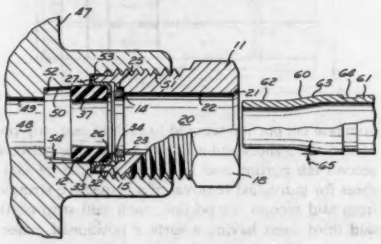
a rigid coupling having a rigid hollow element and a compressible hollow element arranged coaxially about the rigid hollow element and attached thereto so as to form at one end of the coupling a socket for receiving the other end of the ferrule, one end of the discharge pipe being permanently and fixedly attached to the inner surface of the rigid hollow element; and

clamp means for compressing the compressible hollow element into sealing engagement with the ferrule, wherein the rigid hollow element engages and supports the ferrule and the discharge pipe and cooperates with the compressible hollow element and the clamp means so as to substantially prevent the ferrule from moving radially relative to the coupling, whereby the coupling rigidly couples the ferrule to the discharge pipe.

4,191,408
AUTOMOTIVE QUICK CONNECT TUBE COUPLING

Richard C. Acker, Chagrin Falls, Ohio, assignor to The Weatherhead Company, Cleveland, Ohio

Filed May 27, 1977, Ser. No. 801,150
Int. Cl.[2] F16L 17/02
U.S. Cl. 285—113 4 Claims



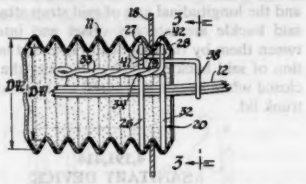
1. A coupling assembly comprising a body, a tube, a nut, a retainer, a spring clip, and an annular elastomeric ringlike seal; said body having an axially extending fluid flow passage, said passage including a nominal diameter portion and a threaded end portion and a counterbore portion between said nominal diameter portion and said threaded end portion; and tube having a cylindrical outer wall, said outer wall having a nominal diameter portion and a reduced diameter end portion and a conical ramp portion between said nominal diameter portion and said reduced diameter end portion, and an annular groove in said outer wall axially spaced from said reduced diameter end portion; said nut being threadably received in said threaded end portion of said body passage, said nut having a tube receiving passage extending axially from end to end therethrough, said tube receiving passage including a nominal diameter portion and an end surface and a counterbore between said nominal diameter portion and said end surface; said spring clip being a C-shaped snap ring disposed in said nut counterbore; said retainer including a cylindrical portion and a radial portion extending from said cylindrical portion, said radial portion being disposed adjacent to said snap ring for retaining said snap ring in said nut counterbore; said tube extending axially through said nut passage and into said body passage, said reduced diameter tube portion being disposed in said nominal diameter portion of said body passage, said conical ramp portion of said tube being disposed in said counterbore portion of said body passage, said snap ring being received in said annular groove of said tube, and said seal being disposed in said counterbore of said body passage on said outer surface of said tube, an end portion of said tube extending completely through the inner diameter of said ringlike seal, said counterbore of said body passage being conical.

4,191,409

CORRUGATED CONDUIT RETAINER

David B. Ballantyne, Southfield, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 28, 1978, Ser. No. 946,506
Int. Cl.² F16L 5/00
U.S. Cl. 285—189 1 Claim



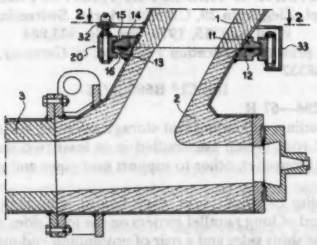
1. A wall with a hole, a corrugated conduit insertable in the hole and having outwardly extending corrugations whose diameter is larger than that of the hole, a single retainer for retaining the corrugated conduit in the hole in the wall, said retainer being receivable within one end of the conduit and comprising a wire having a pair of expandable loops for engaging the interior of two outwardly extending corrugations of the conduit on the opposite interior sides of an intermediate inwardly extending corrugation to resiliently retain the two outwardly extending corrugations outward of the hole on opposite sides of the wall while holding the intermediate inwardly extending corrugation outward against the surface of the hole, said wire further having a pair of arms originating at the loop nearest the one end of the conduit operatively engageable with the other loop and the interior of the conduit so as to be responsive to compression of the conduit by an externally applied force to contract both said loops with said conduit to permit both insertion and removal of the conduit with the retainer in place in the conduit.

4,191,410

DEVICE FOR ASSEMBLING IN PARTICULAR TWO SECTIONS OF A BLAST DOWNPIPE OF A BLAST FURNACE

Henry Voiturier, Dunkerque, and René Aymard, Grande Synthe, both of France, assignors to Union Siderurgique du Nord et de l'est de la France, Paris, France

Filed Sep. 29, 1978, Ser. No. 946,735
Claims priority, application France, Sep. 30, 1977, 77 29505
Int. Cl.² F16L 17/06
U.S. Cl. 285—367 10 Claims



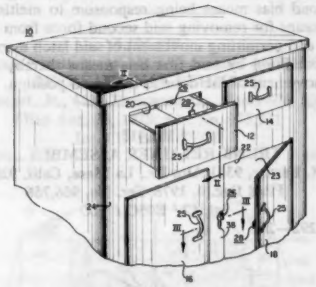
1. In a device for assembling two pipe elements and in particular an upper element and a lower element of a blast downpipe supplying blast to a blast furnace, the device comprising two flanges respectively carried by said two elements, said flanges defining facing sealing surfaces and frustoconical surfaces, jaws arranged around the entire circumference of the flanges in spaced apart relation to each other and defining frustoconical surfaces which are complementary to and cooperative with the frustoconical surfaces of the flanges, links, means pivotally connecting the links to the jaws so that the links and jaws pivot about substantially vertical axes and constitute an articulated collar, clamping and unclamping means combined with the collar for selectively clamping and unclamping the collar, and support means supporting the collar relative to the upper pipe element; the improvement wherein said support means comprise a first support part fixed to the upper pipe element and a second support part having a first end portion and a second end portion which is opposed to the first end portion and is mounted on the first support part to pivot about an axis substantially parallel to said pivot axes, and means supportingly mounting the collar at a plurality of points on the combined first support part and second support part so that the collar is held substantially in a plane perpendicular to said axes while it is movable substantially in said plane for clamping purposes, said mounting points being located in a region of the collar corresponding to substantially three-quarters of the circumferential extent of the collar, and one of said mounting points being located in said first end portion of the second support part, and the second part representing substantially one quarter of the circumferential extent of the collar.

4,191,411

CHILD SAFE LATCH

Milas M. Rodgers, 3139 Medina, Irving, Tex. 75061

Filed Jul. 19, 1978, Ser. No. 926,003
Int. Cl.² E05C 19/06
U.S. Cl. 292—87 5 Claims

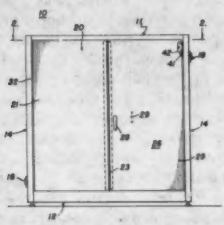


1. A latch assembly comprising, in combination:
a strike plate;
a striker;
the strike plate including a unitary structure having a flat base portion and an abutment portion projecting from the base portion; and,
the striker including a unitary structure having a flat base portion and an elongated resilient leaf spring having an end portion freely projecting from the base portion, the freely projecting end portion having opposite side surfaces disposed for separately engaging the abutment portion as the striker is moved into and out of latching engagement with the strike plate, respectively, the resilient leaf spring being characterized by a yieldable reversing force which permits the tip of the freely projecting end portion when forced into engagement with the abutment to deflect and rotate into a latched position thereon in response to a closing force which is less than a predetermined threshold level, and which permits the free end portion of the leaf to deflect and pass its tip over the abutment in response to an opening force which is equal to or greater than the predetermined threshold level.

4,191,412
DOOR CLOSURE APPARATUS

William R. LeKander, Geneva, Ill., assignor to Lyon Metal Products, Incorporated, Aurora, Ill.

Filed Jun. 16, 1978, Ser. No. 916,248
Int. Cl.[2] E05C 1/06
U.S. Cl. 292—182 17 Claims

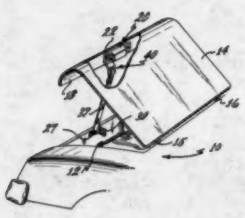


1. Door closure apparatus for a combustible material storage cabinet having a door biased toward a closed position, said apparatus comprising a bracket mounted on the associated cabinet, a latch member carried by said bracket for movement between a latching condition for holding the associated door in an open position and a release condition permitting movement of the door between its open and closed positions, first bias means coupled to said bracket and said latch member and urging said latch member to its release condition with a first predetermined force, and second bias means including a fusible link and coupled to said bracket and said latch member for urging said latch member to its latching condition with a second predetermined force greater than said first force thereby normally to hold said latch member in its latching condition, said second bias means being responsive to melting of said fusible means for removing said second force from said latch member and permitting movement of said latch member to its release condition by said first bias means thereby to permit biased movement of the door to its closed position.

4,191,413
TRUNK RETAINER ASSEMBLY

Harold R. Barner, 9361 Alto Dr., La Mesa, Calif. 92041

Filed Dec. 6, 1978, Ser. No. 966,766
Int. Cl.[2] E05C 17/00
U.S. Cl. 292—262 4 Claims



1. In combination with an automobile having a trunk compartment with a trunk lid hinged adjacent its forward end forming the top surface of the trunk compartment, a trunk retainer assembly comprising:

an elongated strap,

a buckle having a strap attaching portion, an intermediate portion, and a mounting portion,

means for detachably securing one end of said elongated strap to said buckle, comprising a pair of longitudinally spaced slots on said strap attaching portion of the buckle, one of said slots being a top slot and the other a bottom slot, said slots extending laterally with the longitudinal axis of said strap attaching portion whereby said strap can be threaded through said top slot and then its direction reversed 180 degrees so that it can be threaded downwardly through said bottom slot.

means for detachably securing one end of said elongated strap to the interior of said trunk compartment, and

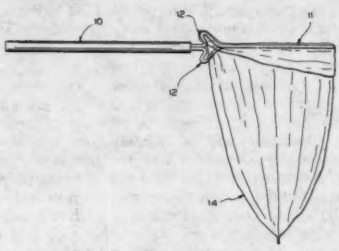
means for detachably securing said buckle to the interior of said trunk lid.

the longitudinal axis of said mounting portion of said buckle and the longitudinal axis of said strap attaching portion of said buckle are laterally offset and interconnected between them by the diagonally oriented intermediate portion of said buckle thereby allowing the trunk lid to be closed while buckle is secured to the inside surface of the trunk lid.

4,191,414
SANITARY DEVICE

James Dameron, 2150 N. Racine, Chicago, Ill. 60614

Filed Jan. 5, 1977, Ser. No. 756,895
Int. Cl.[2] A47F 13/06
U.S. Cl. 294—1 BA 6 Claims



1. A sanitary device for holding a commonly available plastic bag free of attachment means, comprising:

a wire frame disposed on one end of an elongated handle, said frame forming a planar loop at the end of said handle; bight means extending outwardly from the plane of said wire frame substantially near where the wire frame joins said handle; a disposable plastic bag removably mounted on said wire frame by folding the periphery of the open end of said bag around said frame and over said outwardly extending bight means, whereby said bight means causes said plastic bag to stretch tautly over said bight means and said wire frame securing said plastic bag to the wire frame.

4,191,415
STORAGE AND TRANSPORTATION APPARATUS

Heinz Frei, Ziegelrain 29, CH-5001 Aarau, Switzerland

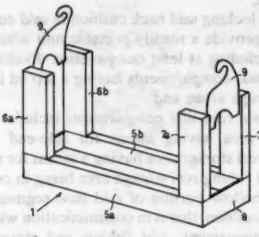
Filed Aug. 15, 1978, Ser. No. 933,884
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1977, 2738332
Int. Cl.[2] B66C 1/16
U.S. Cl. 294—67 R 2 Claims

1. A loading, unloading and storage assembly for elongated pipes and rods which are cradled in at least two stock racks separated from each other to support said pipes and rods comprising:

a plurality of stock racks, each having a rectangular base formed of long parallel girders on the long sides and plates on the short sides and a pair of upstanding end members of equal height at each short side of said rectangular base, which end members define a cradle along the long side for supporting said pipes and rods;

a pair of flat suspension plates on each stock rack, each plate being in the form of a generally rectangular base portion which is welded to the upper inner portions of the upstanding end members and lies in a vertical plane of said

upstanding end members and an inwardly tilted curvilinear hook portion bent along a line near the top of said upstanding end members to define an inwardly tilted angle of about 165 degrees measured along the inner surface of said suspension plate from said line, said hook portions opening in the same direction and said inwardly tilted angle of about 165 degrees permitting stacking of a plurality of said stock racks touching each other at their bases in end to end relationship while permitting lifting and transport from the hook portions and

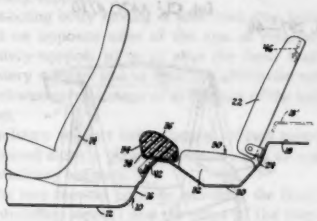


a traverse support including a longitudinal body with at least two pairs of short arms adjacent the ends thereof which are perpendicular to said body, each of said short arms being connected to said longitudinal body by a reinforcement and guiding plate comprising a bevelled guide edge near the free end of the arms, and the free end of the arms being equipped with securing plates having oblique guide extensions extending substantially parallel to said guide edge on the adjacent reinforcement and guiding plate.

4,191,416
LIFT ASSEMBLY
Edward Nist, 246 Redwood Rd., Venice, Fla. 33595
Filed Dec. 8, 1978, Ser. No. 967,603
Int. Cl.[2] B66C 1/12
U.S. Cl. 294—74 **10 Claims**

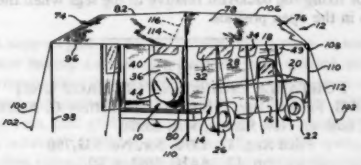
1. A lift assembly of the type primarily designed for removal of an injured person from a boom supported aerial basket, said lift assembly comprising: assembly support means connected to the boom and positioned to supportingly mount said lift assembly in communicating relation to the aerial basket, a pulley and cable assembly attached to the boom, said cable movably disposed to have its length travel along said pulley into and out of direct communication with the aerial basket, sling means connected to said cable and configured for securing engagement with a person in the aerial basket, whereby and incapacitated person can be readily removed from the basket by attachment of said sling means and force being applied to said cable.

4,191,417
VEHICLE SEAT
Rudolph A. Ferrara, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Jun. 28, 1978, Ser. No. 919,803
Int. Cl.[2] A47C 1/02
U.S. Cl. 296—65 R **3 Claims**



1. In an automotive vehicle body, said body including a seat structure of the type including a seat cushion rising from seat rear to seat front and conventionally providing full pelvic and at least partial thigh support, the improvement comprising, said seat cushion having separate main and bolster portions, said main portion being mounted stationary on the vehicle body and providing the full pelvic support, said bolster portion providing said at least partial thigh support, and means mounting said bolster portion on the vehicle body for movement relative to said main portion between a normal condition lying adjacent and higher than said main portion so as to provide therewith said conventional full pelvic and at least partial thigh support rising from seat rear to seat front, and a stowed condition displaced to a position remote from said main portion.

4,191,418
MODULAR DESIGN OF MULTI-SIDED AWNING FOR RECREATIONAL VEHICLES
Larry Ladegast, Jr., 4437 Rockwood Dr., Louisville, Ky. 40220
Filed Aug. 23, 1978, Ser. No. 935,921
Int. Cl.[2] E04F 10/10
U.S. Cl. 296—163 **18 Claims**



1. A multi-sided awning for use with a recreational vehicle comprising:

a. a first awning panel having first fastener means arranged along a first edge of the panel, said fastener means being adapted to engage with a first edge of a wall of the vehicle, and first supporting means arranged on a second opposite edge of the panel, said supporting means being adapted to engage upright support means;

b. a second awning panel having second fastener means arranged along only a portion of a first edge of the panel, said fastener means being adapted to engage with a second edge of a wall of the vehicle adjacent to said first edge, the remaining portion of said first edge of the second panel being generally coextensive with a third edge of the first awning panel, and second supporting means arranged on a second opposite edge of the second panel, said supporting means being adapted to engage upright support means; and

c. quick-connect fastener means joining the said coextensive

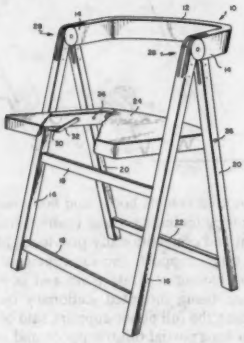
portion of said first edge of the second panel with the third edge of the first awning panel.

4,191,419

HINGE MECHANISM FOR FOLDING CHAIRS

Michael F. Kirkpatrick, Lincoln Center, Lincoln Rd., Lincoln, Mass. 01773

Filed Oct. 26, 1978, Ser. No. 955,103
Int. Cl.[2] A47C 4/10
U.S. Cl. 297—48 **7 Claims**



1. In a folding chair having a back-rest with terminal ends, interconnected pairs of first and second legs, and a seat pivotally connected to the second legs, said chair being adjustable between a folded position with the first and second legs, the seat and the back-rest substantially parallel, and an open position in which the first and second legs and the back-rest are angularly disposed relative to each other with the seat linked to and resting on supports carried by the first legs to hold the first and second legs in an open position, the improvement comprising:

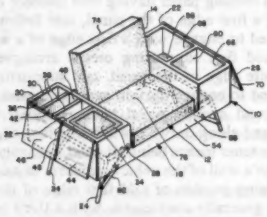
hinge mechanisms pivotally connecting each terminal end of said back-rest with a first leg and a second leg, said hinge mechanisms including releasable gravity-independent locking means responsive only to the angular displacement of the back-rest and legs with respect to each other for fixing the back-rest relative to the legs when the chair is in the open position.

4,191,420

PORTABLE CHAIR AND STORAGE UNIT

Kendall G. Fassett, Rte. 1, Box 317, and Jeffery G. Norris, Box 317, both of, New Lisbon, Wis. 53950

Filed Aug. 11, 1978, Ser. No. 932,780
Int. Cl.[2] A47C 7/62, 4/00
U.S. Cl. 297—194 **9 Claims**



1. A portable chair and storage unit, comprising, in combination:

a chair foundation, including a base segment flanked by a first and a second side compartment, wherein at least one of said side compartments has a top lid hingedly secured along the outer edge of said side compartment so as to open away from said chair seat;

a chair seat, including a bottom and a back cushion, said bottom cushion being supported on and secured to said base segment, and said back cushion being movable between a generally upright functional position, to a compacted position generally overlying said bottom cushion, said first and second side compartments being of a sufficient height to form a substantially planar surface with the back face of said back cushion when in said compacted position;

means for locking said back cushion in said compacted position to provide a readily portable unit when compacted;

further including at least one partition dividing at least one of said side compartments having a top lid into more than one storage areas; and

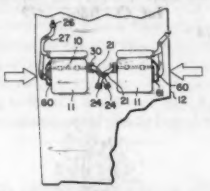
wherein said first side compartment includes a fishing reel storage area having means for side-end opening, said fishing reel storage area having a means for side-end opening, said fishing reel storage area being in communication with a hollow portion of said base segment, below said bottom cushion, that is in communication with said second side compartment, said fishing reel storage area, base hollow portion, and second side compartment together forming a fishing rod storage area, whereby a portable chair and storage unit that allows access to side storage compartments including a storage area for fishing rods, both when the back cushion is in the upright and in the compacted position, is provided.

4,191,421

SIDE COLLISION SAFETY SEAT BELT STRUCTURE

George S. Lechter, 99 Pond Ave., Apt. 205, Brookline, Mass. 02146

Filed Apr. 5, 1978, Ser. No. 893,293
Int. Cl.[2] A62B 35/00
U.S. Cl. 297—483 **4 Claims**



1. A seat belt mounting structure for use in a vehicle which disengages a fastened seat belt under a condition of a sidewise impact to the vehicle so as to prevent entrapment of an occupant of a seat in the vehicle who is fastened to the seat by the seat belt, comprising

a seat belt fitted with first detachable means to fasten about an occupant of a seat in a vehicle, said seat belt fitted with second detachable means to fasten to the frame of the vehicle adjacent an inner side of the seat,

said second detachable means responsive to lateral movement of a member thereof in the direction away from the outer side of said seat and towards the inner side of said seat such that a given amount of said movement caused by a sidewise impact upon said vehicle serves to disengage the seat belt from said second detachable means while normally keeping said second detachable means engaged with said seat belt in the absence of a sidewise impact upon said vehicle.

4,191,422
ADJUSTABLE HEADREST

Hideho Inasawa, and Yoshinori Akiyama, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Aug. 2, 1978, Ser. No. 930,247
Claims priority, application Japan, Nov. 30, 1977, 52/160513
Int. Cl.[2] A47C 1/10
U.S. Cl. 297—391 5 Claims

1. An adjustable headrest for a vehicular seat arrangement comprising:

a stationary guide rail supported on the vehicular seat, said guide rail having a plurality of first notches;

a slide rail slidably movable along said guide rail forwardly and backwardly of the seat, said slide rail having at least one second notch, a part of said second notch of the slide rail being adapted to align with one of said plurality of first notches of the guide rail;

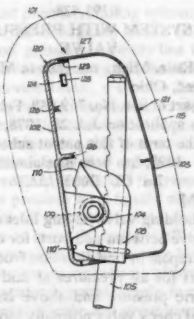
a manually operable shaft axially reciprocally supported on said slide rail over the aligned notches, said shaft having biasing means for resiliently holding said shaft in its inoperative position and at least one latch element arranged to engage in the aligned notches of said slide rail and of said guide rail when said shaft is in said inoperative position; and

a rigid cover enclosing said guide rail, said slide rail and said shaft assembled together and fastened to said slide rail for the back and forth movement therewith.

4,191,423
HEADREST FOR VEHICLES

Walther Göldner, Ebersbach, Fed. Rep. of Germany, assignor to Recaro GmbH & Co., Kirchheim, Fed. Rep. of Germany

Filed Dec. 15, 1978, Ser. No. 969,959
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1977, 7739993[U]
Int. Cl.[2] A47C 7/38
U.S. Cl. 297—408 8 Claims



1. In a headrest for vehicles, especially motor vehicles, including an upholstery support having front and back walls, holder means for pivotably mounting in a frictional manner the upholstery support, and stop means for limiting the pivotal range of movement of the upholstery support, the improvement wherein said stop means comprises:

at least one connecting body mounted to the holder means and pivotably mounted to the upholstery support,

said connecting body defining the axis of rotation of the upholstery support,

said connecting body having at least two stop surfaces arranged on opposite sides of the axis of rotation of the upholstery support so as to abut the front wall of the upholstery support and to limit the clockwise and counterclockwise pivotal range of movement of the upholstery support;

said upholstery support being formed of two support portions joined along a plane through the axis of rotation of the upholstery support;

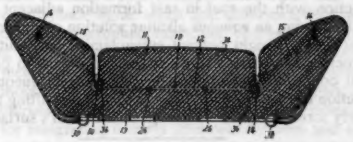
one of the two support portions including the front wall of the upholstery support and the other of the two support portions including the back wall of the upholstery support; and

said front wall being thicker than said back wall, so as to enable raised side edges of the back wall to fit over stepped side edges of the front wall and to enable the back wall to be more flexible to thereby better dampen the shock of an impact.

4,191,424
SUPPORT GRID FOR UPHOLSTERED SEATING

Donald D. Mundell, Carthage, Mo., assignor to Flex-o-lators, Inc., Carthage, Mo.

Filed Jul. 17, 1978, Ser. No. 925,108
Int. Cl.[2] A47C 7/02
U.S. Cl. 297—459 6 Claims



1. A support grid for an upholstered seat bottom or seat back structure having a transversely central main seating area and side wing portion seating areas at the sides of said main seating area and inclined outwardly and upwardly from said main seating area, said grid comprising a wire fabric including:

a. a series of closely spaced, generally parallel spring cross wires extending transversely of said seating structure, the central portions of said cross wires defining said main seating area, and the end portions of said cross wires being angled upwardly and outwardly to define said wing seating areas, each of said cross wires being twice rebent on itself at each side of said main seating area to form an S-bend disposed in a plane generally normal to said seating areas and each including an inwardly opening lower loop and an outwardly opening upper loop, and

b. a pair of resilient side strands extending transversely to said cross wires respectively at each side of said main seating area and each confined in said inwardly opening lower loops of the S-bends of said cross wires at its associated side of said main seating area, the cross wires continuing outwardly from said upper loops to define said wing seating areas, whereby top-loading of said wing seating areas flexes said cross wires, tending to restrict said upper loops, expand said lower loops, and loosen the engagement of said side strands in said lower loops, said grid being covered by a layer of padding material.

4,191,425

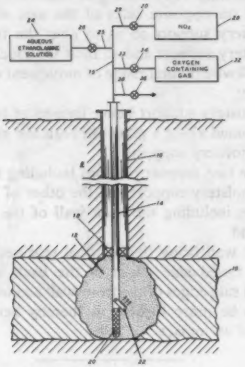
ETHANOLAMINE IN A METHOD OF RECOVERING COAL IN AQUEOUS SLURRY FORM

Bruce W. Davis, Fullerton, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 831,035, Sep. 6, 1977, Pat. No. 4,132,448. This application Dec. 20, 1978, Ser. No. 971,575

Int. Cl.[2] B02C *19/00*; E21C *41/02*

U.S. Cl. 299—5 **2 Claims**



1. A method for recovering lignitic, sub-bituminous or bituminous coal in slurry form from a coal-containing formation comprising establishing a flow path from the earth's surface to a lignitic, sub-bituminous or bituminous coal-containing formation, flowing through said flow path a gaseous mixture containing up to 99 volume percent oxygen and at least about one volume percent NO_2, up to an amount of NO_2 that will remain in vapor phase in said gaseous mixture, and contacting said coal-containing formation with said gaseous mixture to cause a reaction with the coal in said formation adjacent said flow path, flowing an aqueous alkaline solution containing from at least 0.25% weight percent ethanolamine to about 5 weight percent ethanolamine through said flow path to contact the coal contained in said formation with said aqueous alkaline solution to break up and slurry the coal, and lifting the coal in slurry form from said formation to the earth's surface.

4,191,426

SEALING GUARD FOR A SURFACE TREATING MACHINE

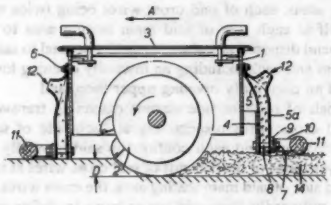
Peter Ely, Ossett, England, assignor to Dresser Europe S.A., Brussels, Belgium

Filed May 3, 1978, Ser. No. 902,504

Claims priority, application United Kingdom, May 3, 1977, 18557/77

Int. Cl.[2] E01C *23/08*

U.S. Cl. 299—39 **7 Claims**



1. A guard for a machine in which in operation a rotary element of the machine and a surface requiring an operation to be performed thereon by the rotary element are relatively displaced, comprising a first guard portion encircling the rotary element and secured to the machine so as to leave a gap between the guard portion and the surface, and a second guard portion encircling the rotary element and mounted on the first guard portion by mounting means permitting relative movement between the first and second guard portions and in a manner to close substantially the gap between the first guard portion and the surface, in which the mounting means defines a jacket having an inlet opening and also an outlet opening to direct a fluid based substance introduced into the inlet opening onto the surface adjacent the said element.

4,191,427

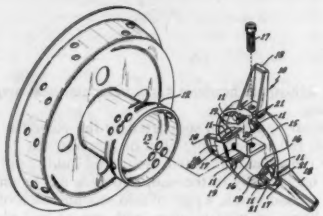
SIMULATED KNOCK OFF SPINNER NUT

Robert A. Bradley, Santa Ana, Calif., assignor to Tru-Spoke, Inc., Anaheim, Calif.

Filed Jun. 26, 1978, Ser. No. 919,325

Int. Cl.[2] B60B *7/06*

U.S. Cl. 301—108 S **10 Claims**



1. For use with a vehicle wheel of the type having a circular hub opening including a generally axially smooth interior sidewall surface portion, a simulated knock off wheel spinner nut comprising:

a. a simulated spinner nut having a first portion of a generally cylindrical cross section and having mounting means for axially aligning the spinner nut relative to the hub opening and being sized to be slidably inserted into the circular hub opening of the vehicle wheel for partially receiving the nut within the hub opening; and

b. means for securing said spinner nut to the vehicle wheel comprising a plurality of tabs spaced about the inner circumference of said first portion each having a screw threadably inserted therein with said screw passing through said first portion of said spinner nut and having its head outside thereof for drawing each of said tabs radially outwardly into frictional locking engagement with the interior sidewall surface of the circular hub opening of the wheel.

4,191,428

AIR BRAKE SYSTEM WITH PRESSURE HOLDING VALVE

Harold Durling, Elsie, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 769,548, Feb. 17, 1977, Pat. No. 4,119,351. This application Jul. 28, 1978, Ser. No. 928,737

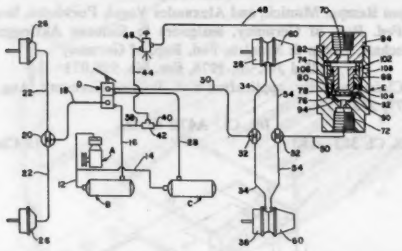
The portion of the term of this patent subsequent to Aug. 10, 1995, has been disclaimed.

Int. Cl.[2] B60T *15/20*

U.S. Cl. 303—6 M **7 Claims**

6. A pressure holding valve having inlet and delivery ports, a single check valve between said ports for normally providing flow directly therepast in one direction from said inlet port to said delivery port for all pressures at said inlet port slightly above atmospheric pressure and above the pressure at said delivery port, said check valve normally blocking reverse flow in an opposite direction from said delivery port to said inlet port at relatively low pressure drops from said delivery port to

said inlet port when said inlet port is at operational pressures substantially above atmospheric pressure and the pressure at said delivery port exceeds the pressure at said inlet port, movable pressure responsive means operable solely by pressure differentials in the absence of springs for movement in response to a relatively high pressure drop from said delivery port to



said inlet port upon lowering of the pressure at said inlet port below said operational pressures for providing flow directly past said check valve in said opposite direction, and said pressure responsive means being operative as aforesaid to provide reverse flow in said opposite direction for reducing the pressure at said delivery port to atmospheric pressure when the pressure at said inlet port is atmospheric.

4,191,429

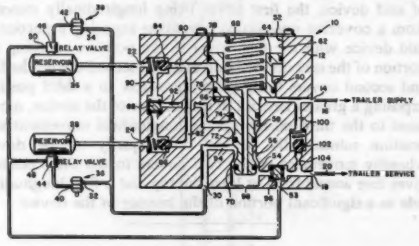
FLUID PRESSURE BRAKING SYSTEM HAVING EMERGENCY VALVE

Richard J. Reitz, Amherst, and Edward J. Kruke, Lorain, both of Ohio, assignors to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 759,228, Jan. 13, 1977, abandoned. This application Jan. 12, 1978, Ser. No. 868,943

Int. Cl.[2] B60T *15/56*

U.S. Cl. 303—58 **13 Claims**



1. In a vehicle fluid pressure braking system, a fluid pressure source, a reservoir, an emergency brake held in a released condition by hold-off pressure, a supply line for communicating hold-off pressure to said emergency brake and for charging said reservoir, a service brake, a service line, service brake application effecting means responsive to the fluid pressure level in said service line for communicating said service brake to the fluid pressure level in said reservoir, and emergency means located in the supply line upstream of the reservoir between the fluid pressure source and the reservoir, responsive to a decrease in the pressure level in said supply line for communicating said hold-off pressure to said service brake application effecting means to cause the latter to effect a service brake application by communicating said service brake to said reservoir, said emergency means including a piston movable from a first position communicating said supply line with said reservoir and said emergency brake and preventing communication between said reservoir and said service brake application effecting means to a second position preventing communication between said reservoir and said supply line, said emergency means in said second position also preventing communication between said reservoir and said emergency brake, said emergency means in said second position initiating communication between said emergency brake and said service brake application effecting means.

4,191,430

ANTI-LOCK DEVICE FOR RAILWAY VEHICLES

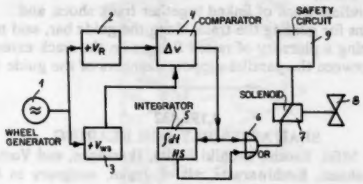
Klaus Schirmer, Geiselbullach, Fed. Rep. of Germany, assignor to Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 842,337, Oct. 14, 1977, abandoned. This application Dec. 7, 1978, Ser. No. 967,125

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1977, 2701456

Int. Cl.[2] B60T *8/10*

U.S. Cl. 303—109 **4 Claims**



1. In an anti-lock device particularly for railway vehicles, the combination of means for generating a signal indicative of the wheel speed, means for generating a reference signal substantially indicative of the speed of the vehicle, comparator means connected to both said wheel speed and vehicle speed signal generating means for generating a signal corresponding to the difference between said wheel and vehicle speeds when said difference exceeds a first predetermined value and for ceasing said difference signal when said difference decreases below a second predetermined value, said first predetermined value being greater than said second predetermined value, integrator means connected to the output of said comparator means for integrating said difference signal linearly upwardly until the difference signal ceases at said second predetermined value and for integrating linearly downwardly from said second predetermined value, said integrator means having means therein for generating an auxiliary signal indicative of the adhesive factor between the vehicle wheel and the surface upon which the wheel is rolling when the integrated signal is above a third predetermined value, said third predetermined value being derived from said difference signal and being a function of an assumed speed of the vehicle, said third predetermined value being linearly dependent upon said reference signal, and means connected to the output of said comparator means for generating an anti-locking signal in response to said generated difference signal to release the vehicle brakes, said anti-locking signal being continuously generated until the point at which both said difference signal and said auxiliary signal have ceased at which point the brakes are applied.

4,191,431

TRACK-TYPE VEHICLE UNDERCARRIAGE AND LINK ASSEMBLY

Robert D. Roley, Peoria, and Roy L. Maguire, Edelstein, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 17, 1977, Ser. No. 842,816

Int. Cl.[2] B62D *55/10, 55/14, 55/20, 55/30*

U.S. Cl. 305—18 **7 Claims**

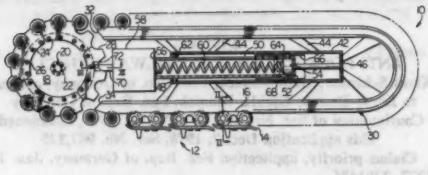
1. A vehicle undercarriage comprising:

a guide bar, said guide bar being substantially "U" shaped and having parallel support members;

a tubular member connected to the guide bar;

a recoil receiving member movably mounted in the tubular member;

a recoil piston having a first end connected to the tubular member and having a second end movably mounted in the recoil receiving member;



means for biasing the recoil piston and its associated tubular member and guide bar relative to the recoil receiving member;

an endless track of linked together track shoes; and

means for guiding the track along the guide bar, said means being a plurality of raised flanges on the track extending between the parallel support members of the guide bar.

4,191,432

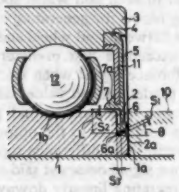
SEAL ASSEMBLY FOR BEARING

Toshio Miki, Yaoshi; Yoshiki Fujita, Ikomagun, and Yoshihisa Kawakami, Kashiwarashi, all of Japan, assignors to Koyo Seiko Company Limited, Osaka, Japan

Continuation of Ser. No. 836,653, Sep. 26, 1977, abandoned. This application Oct. 12, 1978, Ser. No. 951,268

Int. Cl.[2] F16C *33/76*

U.S. Cl. 308—187 **2 Claims**



1. A seal assembly for an anti-friction bearing comprising: an inner ring formed with a shoulder including a peripheral stepped portion having a great depth radially inwardly of the periphery of the inner ring, a side face and a peripheral bottom face tapered axially inwardly of the inner ring and having an increasing diameter toward the axially outer end of the inner ring and an annular seal member having its outer periphery secured to the inner periphery of one end of an outer ring and reinforced with a metal core, said metal core having an inside diameter greater than the outside diameter of the inner ring, the annular seal member having on its inner periphery a first elongated flexible seal lip extending radially inwardly thereof linearly along the side face of the stepped portion of the inner ring with a small clearance formed between the first elongated flexible seal lip and the side face and a second seal lip projecting axially inwardly of the bearing along the outer periphery of the inner ring with a small clearance formed between the second seal lip and the outer periphery of the inner ring whereby the flow of the lubricant enclosed in the bearing is guided axially inwardly of the bearing, the first seal lip having an annular projection axially projecting from the inner side of its inner peripheral portion lightly in contact with the side face of the inner ring stepped portion and another annular projection axially projecting from the outer side of its inner peripheral portion, the first seal lip further having a tapered inner peripheral face positioned to provide small clearance between the tapered inner peripheral face and the peripheral bottom face of the stepped portion, the first seal lip tapered inner peripheral face having an axial length not greater than the axial length of the tapered bottom face of the stepped portion.

4,191,433

HOUSING FOR A DEVICE, IN PARTICULAR FOR A PRINTER

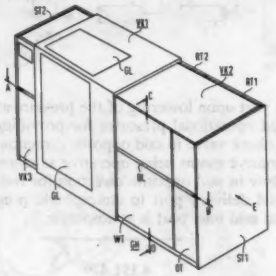
Egon Rampp, Munich, and Alexander Vogel, Puchheim, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 26, 1978, Ser. No. 928,071

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1977, 2737933

Int. Cl.[2] A47B *63/00*

U.S. Cl. 312—183 **15 Claims**



1. A housing for a non-mechanical printer device wherein individual areas of the internal mechanism of the printer are to be freely accessible for purposes of servicing and operation comprising a housing including at least first and second cover portions, said first cover covering a portion of a top of said device and a portion of a first longitudinal side of said device, said second cover providing a cover for a second portion of said device and a second portion of said first longitudinal side of said device, the first cover being longitudinally movable from a covering position to a position exposing a portion of said device with the first cover in the position exposing the portion of the said device lying over the second cover, the first and second covers being jointly movable to a third position exposing a greater amount of the interior of the device, movement to the third position being longitudinal movement to a position substantially beyond the majority of the device whereby movement of the two covers to the third position gives free access from at least the top and a first longitudinal side to a significant portion of the interior of the device.

4,191,434

REFRIGERATOR COMPARTMENT PARTITIONING MEANS

John M. Powell, Charlestown, Ind., and K. Bailey Keeling, Jr., Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Jul. 28, 1978, Ser. No. 928,934

Int. Cl.[2] F25D *11/00*

U.S. Cl. 312—214 **6 Claims**

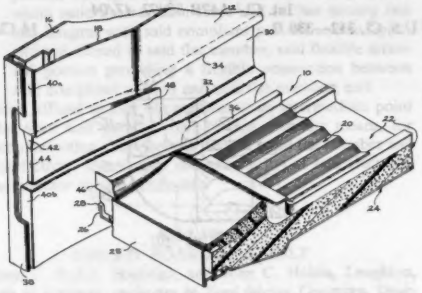
1. Compartment partitioning means for a refrigerator cabinet of the type containing an outer shell and a plastic inner liner comprising

a metal plate defining a surface of a fresh food compartment and having a raised edge extending along the sides and back thereof,

an elongated strip of compressible, resilient material folded longitudinally across and along said edge to form a thermally insulating seal between said plate and the adjacent walls of said liner,

a mass of insulating material forming a thermal compartment

divider disposed against said plate, said strip also forming a thermally insulating seal between said plate and divider, a plastic tray defining a surface of a freezer compartment and having raised flat rims extending along the sides thereof, said tray being disposed against said divider, said plate, divider and tray forming a partition, and



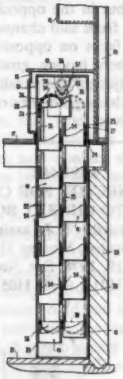
a pair of channels formed on the sides of said liner and being partially defined by a pair of ledges which overlap said flat rims such that said liner and tray may be spaced relative to one another without producing an unsightly gap therebetween.

4,191,435

CABINET STORAGE CONVEYOR

John C. Lehman, Marietta, Pa., assignor to John C. Lehman, Inc., Marietta, Pa.

Filed Mar. 3, 1978, Ser. No. 883,294
Int. Cl.[2] A47B *49/00*
U.S. Cl. 312—266 **9 Claims**



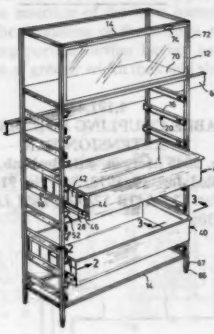
1. In an article storage and transport system for cabinets and the like, a modular preassembled article storage and transport conveyor apparatus including a unitary boxlike housing mounted at least partially within a space encompassed by said cabinets through an opening means formed in said cabinets, said cabinets and said housing having coinciding passage means allowing easy access to the interior of said system, a pair of endless conveyor chains in offset relationship and disposed in laterally spaced parallel planes, each chain having multiple articulated links, plural equidistantly spaced article storage and transport trays suspended at diagonally opposite corners in level relationship from said chains, said trays adapted to pass in succession adjacent to said coinciding passage means of the cabinets and housing, fixed guide track means for said chains on said housing and defining continuous uninterrupted guidance paths for the endless chains along their entire movement paths, and power drive means for said chains on said housing including a pair of sprocket gears in operative engagement with the exteriors of said chains at a fixed point on each chain.

4,191,436

CABINET FOR USE IN MOBILE VEHICLE

Richard S. Cherry, Don Mills, Canada, assignor to The Streakers International Incorporated, Toronto, Canada

Filed Jul. 25, 1978, Ser. No. 927,876
Int. Cl.[2] A47B *43/00, 88/00*
U.S. Cl. 312—293 **5 Claims**



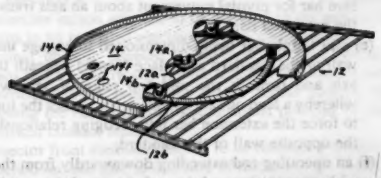
1. A cabinet, for use in a mobile van or truck, comprising:
a rectangular frame having vertical legs interconnected by horizontal struts;
at least one extensible drawer suspension means mounted on the frame, said means including a pair of opposed extensible channel-shaped runners each having a plurality of hook means projecting laterally therefrom;
at least one tray having a pair of opposed sides with bar means fixed horizontally parallel to each side and spaced therefrom, the bar means being engagable with the hook means of the opposed runners whereby the tray is removably carried by the suspension means; and
releaseable means to hold the tray in closed position in the frame with the suspension means retracted.

4,191,437

REFRIGERATOR STORAGE SYSTEM

Ludwig F. Funke, 7200 Newburgh Rd., Evansville, Ind. 47715

Continuation-in-part of Ser. No. 743,913, Nov. 22, 1976. This application May 30, 1978, Ser. No. 910,733
Int. Cl.[2] A47B *57/00*
U.S. Cl. 312—305 **8 Claims**



1. A rearrangeable storage system for a refrigerator having a plurality of storage shelves comprising at least one removable and rotatable shelf adapted to travel a 360° path within the confines of a supporting storage shelf, load supporting means arranged on the undersurface of said rotatable shelf outwardly of the rotational axis thereof, tracks disposed on said storage shelves for rolling engagement by said mounting means to

achieve various storage arrangements with the relocation of said rotatable shelf, and means maintaining said rotatable shelf at a preselected position on said storage shelves, where unobstructed space is provided between said rotatable shelf and the next adjacent upper storage shelf, where portions of said storage shelves remain usable when said rotatable shelf is at said preselected position on said storage shelves, and where the full areas of said storage shelves remain usable after any relocation of said rotatable shelf.

4,191,438

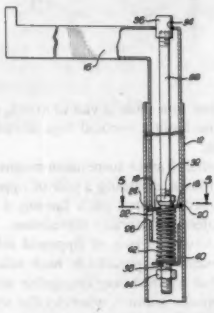
RELEASABLE COUPLING FOR DISPLAY UNIT EXTENSION BAR

Robert H. Day, 2045 Morgan, #B, Burbank, Calif. 91504

Filed Jun. 19, 1978, Ser. No. 916,605

Int. Cl.[2] A47B *57/00*; F16M *11/00*

U.S. Cl. 312—306 **6 Claims**



4. In a display unit or the like:

(a) a construction of square tubular parts, one of the parts being a vertical standard open at its upper end;

(b) an extension bar of square tubular construction and slidably fitted into said standard;

(c) said extension bar having at its lower end, a narrow slot extending transversely across one side of the extension bar and a wide slot on the opposite side, the top edge of which wide slot lies beneath the level of the narrow slot;

(d) a toggle bar in the form of a plate having one end fitted in the narrow slot and its other end projecting through the wide slot so that the toggle bar is mounted by the extension bar for pivotal movement about an axis transverse to the extension bar;

(e) said toggle bar being dimensioned to engage inside one wall of the standard at a place located beneath the pivot axis and beneath the said top edge of said wide slot whereby a load on said extension bar causes the toggle bar to force the extension bar into wedging relationship with the opposite wall of the standard;

(f) an operating rod extending downwardly from the top of said extension bar and through the toggle bar, said operating rod having an abutment above the toggle bar for moving the toggle bar away from said one inside wall to release the extension bar;

(g) a coil spring surrounding the operating rod and located beneath the toggle bar for biasing the toggle bar to move upwardly about said pivot axis.

4,191,439

DRAWER CONSTRUCTION

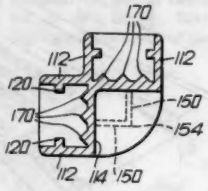
Arik Cohen, Jerusalem, Israel, assignor to Rim Jerusalem Furniture Limited, Jerusalem, Israel

Filed May 31, 1978, Ser. No. 911,196

Claims priority, application United Kingdom, Jun. 1, 1977, 23307/77; Nov. 25, 1977, 49267/77

Int. Cl.[2] A47B *88/02, 47/04*

U.S. Cl. 312—330 R **14 Claims**



1. A drawer construction comprising a front member, a back member, two side members, a bottom and a plurality of brackets respectively interengaging adjacent members, wherein each of said brackets includes a pair of traversely spaced side walls, a base wall connecting said side walls and defining with said pair of side walls a channel open at one end and closed at the other end by an end wall and wherein said channels are each provided with a pair of interfacing longitudinal guide ribs extending along the interiors of the side walls of the channel and disposed intermediate the base wall and the free edge of their respective side wall, said channels further being provided with longitudinally extending locking rib sections, said guide ribs and locking ribs permitting insertion of an end of one of said members in said channel by relative linear movement parallel with the longitudinal extent of the channel but inhibiting relative linear movement parallel with the longitudinal extent of the channel but in the opposite direction for withdrawal of said member from said channel, all of said members having parallel major faces on opposite sides thereof and a plurality of said members having grooves in their opposite major faces disposed adjacent and parallel with their end faces and complementary with the guide ribs of the channel in which said end faces are received.

4,191,440

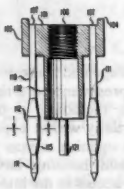
ELECTRICAL CONNECTOR FOR COUPLING POWER LEADS TO CIRCUIT BOARDS

Eugene C. Schramm, Denville, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 19, 1978, Ser. No. 943,733

Int. Cl.[2] H01R *9/18*; H05K *1/12*

U.S. Cl. 339—17 C **11 Claims**



1. An electrical connector comprising:

a generally flat, unitary member of electrically conductive material having at least one aperture therein for terminating at least one electrical conductor;

means, affixed to said flat member in parallel rows, for electrically and mechanically coupling said member to a circuit board, each of said coupling means including

a compliant portion at an intermediate point along its length for effecting frictional engagement between said coupling means and said circuit board, and

a flexible terminal portion intermediate said compliant portion and said flat member, said flexible terminal portion having a length to a smallest cross-sectional width ratio greater than three and further having one end integral with said compliant portion and an opposite end affixed to said flat member, said flexible terminal portion providing a flexible connection between said compliant portion and said flat member; and

means, affixed to said flat member at an intermediate point between said parallel rows of said coupling means, for counteracting shear stresses between said flat member and said circuit board upon the termination of said electrical conductor to said connector.

4,191,441

CIRCUIT BOARD ASSEMBLY

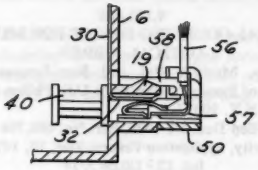
William C. Ryder, Hadleigh, and John C. Hobbs, Loughton, both of England, assignors to Ford Motor Company, Dearborn, Mich.

Filed Feb. 14, 1979, Ser. No. 12,083

Claims priority, application United Kingdom, Feb. 24, 1978, 07574/78

Int. Cl.² H05K *1/12*

U.S. Cl. 339—17 F **16 Claims**



1. A circuit board assembly comprising a circuit board having a front surface, a contact supporting surface extending rearwardly away from said front surface, a flexible circuit sheet mounted on said front surface and having a contact portion which overlies said contact supporting surface and which is accessible from behind said circuit board and a holder removably mounted on said circuit board and retaining said contact portion of said sheet in contact with said contact supporting surface while allowing access to said contact portion from behind of said circuit board; and

said contact support surface having formed therein a respective groove extending rearwardly away from the front surface of said circuit board and said holder including at least one finger extending forwardly from said holder which is slidably engaged in said respective groove, and parts of said at least one finger adjacent said respective groove holding the contact portion of said circuit sheet in engagement with said contact support surface.

4,191,442

ELECTRICAL CONNECTOR AND METHOD OF FABRICATING A WIRE HARNESS USING THE CONNECTOR

Jack E. Caveney, Hinsdale, and Roy A. Moody, Flossmoor, both of Ill., assignors to Panduit Corp., Tinley Park, Ill.

Filed May 25, 1978, Ser. No. 909,732

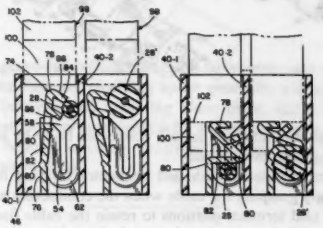
Int. Cl.² H01R *13/38*

U.S. Cl. 339—99 R **24 Claims**

1. An electrical connector for mechanically joining a plurality of wires to a plurality of other electrical components and for providing low resistance electrical paths between predetermined ones of said plurality of wires and preselected ones of said plurality of other electrical components, said connector comprising:

an insulative housing having a front wall, a back wall and a plurality of spaced barrier walls extending between the aforementioned walls to define an array of cavities extending through said housing; and

a plurality of metallic terminal elements each having a wire terminating portion and a portion for contacting another electrical component with one terminal element preloaded into each of said cavities, said wire terminating portion having an open-ended elongate wire-receiving slot of a width less than the diameter of the conductor in the wire to be terminated in the wire terminating portion so that in response to the insertion of the wire laterally of its axis into the slot the insulation of the wire is removed, said wire terminating portion further having an entrance adjoining said slot of greater width than said slot to guide the



wire into the slot, at least one of said housing and plurality of terminal elements comprising holding means for firmly mechanically holding each of said wires in alignment with the entrance to the slot corresponding to that wire prior to insertion of the wire into the slot, said holding means being adapted to hold said wires bent from their as-manufactured axial direction and comprising first means for engaging said wires on the side of said terminal elements remote from said back wall, further comprising second means for engaging said wires on the side of said terminal elements remote from said front wall, and further comprising third means for engaging said wire between said first and second wire engaging means, whereby after positioning of the wires in the holding means and prior to insertion of the wires into the slots, the connector can be physically moved without dissociation of the wires from their corresponding slots.

4,191,443

ELECTRICAL CONNECTOR MEANS

Richard C. Doyle, Greenlawn, N.Y., assignor to Slater Electric Inc., Glen Cove, N.Y.

Filed Jul. 28, 1977, Ser. No. 820,038

Int. Cl.² H01R *13/58*

U.S. Cl. 339—103 R **24 Claims**

1. Connector means adapted to be coupled to the electrical conductors in an insulated electrical cable, comprising:

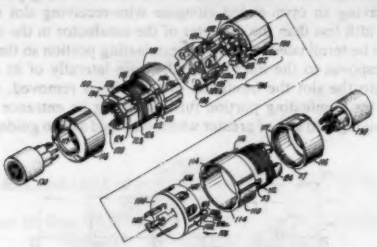
a terminal housing adapted to support electrical contact means and to electrically isolate terminal portions of said electrical contact means yet enable access thereto for coupling the conductors to said terminal portions of said electrical contact means;

a connector front member adapted to be releasably lockably attached on one side to one side of said terminal housing member, said connector front member being adapted to permit access to contact portions of said electrical contact means on its other side, said terminal housing and said connector front member forming a connector body when coupled together;

at least two generally flexible and resilient leg members formed on said connector front member, extending in a direction longitudinally back from its said other side, each

said leg member formed with first engaging means adapted to releasably lockably couple said connector front member and said terminal housing together to form said connector body, and each said leg member also being formed with second engaging means;

a generally cylindrical connector housing member, said connector housing member adapted to receive said connector body and the cable when coupled to said terminal housing, said connector housing adapted to be releasably



lockably attached to said connector body by said second engaging means; and

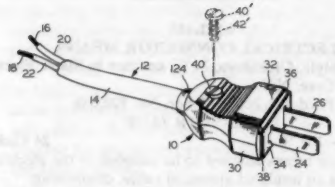
means associated with said connector housing for tighteningly grasping the cable when the conductors are coupled to said terminal portions to retain the cable fixed relative to said connector housing; such that said terminal housing, said connector front member and said connector housing can be retained in assembled configuration by said first and second engaging means without threaded fasteners.

4,191,444

DEAD FRONT PLUG WITH STRAIN RELIEF

Donald F. Smith, Warwick, R.I., and Michael J. Ostrelich, Easton, Conn., assignors to General Electric Company, New York, N.Y.

Filed Dec. 28, 1978, Ser. No. 974,174
Int. Cl.[2] H01R *13/58*
U.S. Cl. 339—107 **6 Claims**



1. A strain relief for a plug, said strain relief comprising:

an insulating housing in three aligned connected sections,

the two end sections folding up in valise formation,

an annular channel in each end section,

said annular channel being disposed about a fastener opening extending through the center portion of said annular channel,

a fastener to force said sections together

and radially extending ribs in said annual channel, the ribs of one channel being offset from those of the opposite channel

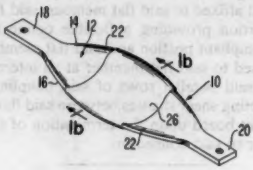
whereby a wire restrained in the said channel is given a sinusoidal configuration around an arc of said channel.

4,191,445

LOUVERED ELECTRICAL CONNECTOR

Robert S. Deal, Los Altos Hills, Calif., assignor to Multilam Corporation, Los Altos, Calif.

Filed Jan. 16, 1976, Ser. No. 649,893
Int. Cl.[2] H01R *13/12*
U.S. Cl. 339—252 R **2 Claims**



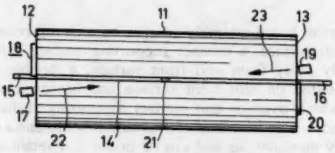
1. An electrical connector comprising: an elongated device having a pair of opposed ends and a louver extending between said ends, the louver having a pair of spaced side margins; and a layer of electrically conducting material on said louver independently thereof for forming an electrical current-carrying path between said side margins, said layer having a number of flexible fingers adjacent to each side margin, respectively, of said louver.

4,191,446

DIRECTIONAL COUPLING-DEVICE FOR MULTI-MODE OPTICAL FIBRES

Hervé Arditty, Marly-le Roi, and Jean-Jacques Hunzinger, Paris, both of France, assignors to U.S. Philips Corporation, New York, N.Y. 10017

Filed Dec. 15, 1975, Ser. No. 640,706
Claims priority, application France, Dec. 16, 1974, 74 41330
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.15 **13 Claims**



1. A directional coupling device for multimode optical fibers, which comprises a coupler body of a material which is transparent in a given wavelength range of optical radiation and which is a carrier for the transmitted information, two axially aligned optical single multi-mode fibers having ends coupled to said body, at least one of which transfers information from one or more information sources which are disposed along an information routing circuit including said optical fibers, at least one of said fibers transferring the information conveyed by the other fiber, to which latter information specific information is added which is introduced in the directional coupling device, the coupled optical fibers being aligned in the body of the directional coupler with said ends of the two optical fibers being fixed opposite each other at an adjustable distance which corresponds to the desired degree of coupling between the two optical fibers, means for introducing light rays into the body of the directional coupler along an axis such that a portion of the light rays is intercept by and enters into at least one of the optical fibers, said latter means for introducing light rays including a radiation source arranged on at least one of the ends of the coupler body, and photo-sensitive means for picking up at least a fraction of the dispersion luminous flux extracted from the luminous flux which passes through at least one of the two fibers and through said coupler body, said

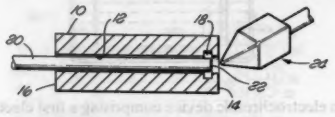
photo-sensitive means comprising at least one photosensitive detector arranged on at least one of the ends of the body of the coupling device.

4,191,447

FIBER OPTIC TERMINATION AND METHOD OF MAKING SAME

Leslie M. Borsuk, Los Alamitos, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 27, 1978, Ser. No. 900,424
Int. Cl.² G02B 5/14
U.S. Cl. 350—96.20 **10 Claims**



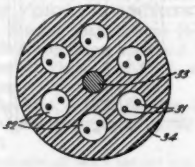
1. A fiber optic termination comprising:
a ferrule having a front mating end and a rear;
a bore extending axially through said ferrule from said rear to said front end;
a recess in the wall of said bore spaced behind said front end; and
an optical fiber inserted into said bore from said rear, said fiber embodying an integral, enlarged forward lens portion extending into said recess to thereby restrict forward and rearward axial movement of said fiber in said bore.

4,191,448

OPTICAL GUIDES

Noel S. Dean; Kenneth L. Lawton, and Vincent A. Yates, all of Wigan, England, assignors to BICC Limited, London, England

Filed Dec. 30, 1975, Ser. No. 645,333
Claims priority, application United Kingdom, Jan. 6, 1975, 423/75
Int. Cl.² G02B 5/16
U.S. Cl. 350—96.23 **16 Claims**



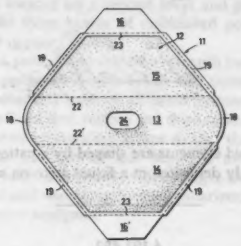
1. An optical cable comprising at least one optical fibre housed loosely in and throughout the length of a bore extending lengthwise in an extruded elongate body of insulating material so that at any transverse cross-section of the cable throughout the whole of its length limited relative movement between the optical fibre and the extruded elongate body can take place when the cable is flexed; at least one separate elongate reinforcing member embedded in said extruded elongate body throughout the whole of the length of the body and arranged side by side with said bore; and, lining the boundary wall of the bore, a metallic tape having on at least its outer surface a coating of plastics material.

4,191,449

GUARD-RAIL REFLECTOR

Masuzo Hirata, Hirakata, Japan, assignor to Toyo Seikan Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1977, Ser. No. 773,002
Int. Cl.² G02B 5/12
U.S. Cl. 350—97 **19 Claims**



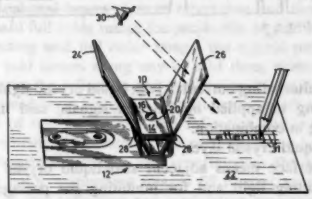
11. The guard-rail reflector of claim 10 wherein said washer has a central fastener receiving space generally aligned with the space between said mounting plane parts, and a pair of reversely turned legs combining with adjacent portions of said washer to define sockets for receiving opposed edges of said mounting plane parts.

4,191,450

DOUBLE CLIP LETTERING GUIDE ADJUSTMENT WEDGE

Daniel H. Hoggan, 952 Foothill Dr., Providence, Utah 84332

Filed Jun. 14, 1978, Ser. No. 915,522
Int. Cl.² G03B 21/56
U.S. Cl. 350—121 **9 Claims**



1. An adjustment wedge for adjusting the angle between the clips of a double clip lettering guide, comprising in combination an adjustment wedge member and means attached to the wedge member for adjusting the position of the wedge member with respect to lettering guide, such that said wedge member and the double clip adjustably position and hold the lettering guide.

4,191,451

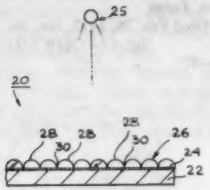
PROJECTION SCREEN AND METHOD OF MAKING SAME

Marvin P. Hodges, Woodland Hills, Calif., assignor to Marv Hodges, Inc., St. Petersburg, Fla.

Filed Apr. 21, 1978, Ser. No. 898,837
Int. Cl.² G03B 21/60
U.S. Cl. 350—126 **42 Claims**

1. An improved projection screen, said screen comprising, in combination:
a. a substrate,

b. a layer comprising a plurality of discrete shaped light-affecting elements deposited on said substrate,



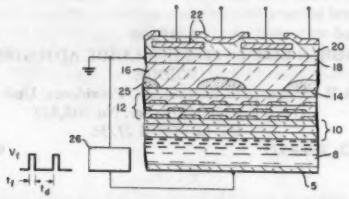
c. wherein said elements are shaped by a patterned tool and subsequently deposited in a liquid state on said substrate.

4,191,452

AC SILICON PN JUNCTION PHOTODIODE LIGHT-VALVE SUBSTRATE

Jan Grinberg; Paul O. Braatz, both of Los Angeles; Michael Waldner, Woodland Hills, and Alexander D. Jacobson, Los Angeles, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 28, 1977, Ser. No. 865,281
Int. Cl.[2] G02P 1/13
U.S. Cl. 350—342 **14 Claims**



1. An alternating current driven liquid crystal light valve for responding to applied information signals, said light valve including in combination:

(a) a liquid crystal layer;

(b) interface means adjacent said liquid crystal layer for reflecting light and for inhibiting the passage of light therethrough;

(c) a light valve substrate structure including a dielectric layer adjacent said interface means, a semiconductor body of predetermined thickness and a first type of conductivity adjacent said dielectric layer, and including in preselected portions of said semiconductor body regions of a second conductivity type forming with the first conductivity type portion of said semiconductor body a set of PN junction diodes adjacent said dielectric layer; and

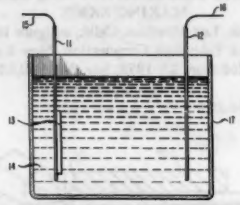
(d) means for applying an AC biasing voltage across said light valve substrate, said interface means and said liquid crystal layer to cause the reverse biasing of said PN junctions during a portion of the AC cycle establishing depletion regions that extend throughout the thickness of said first conductivity type portion and at least portions of said second type conductivity regions estabilishing an electric field in said semiconductor body and charged centers in said second conductivity regions whereby information signal-representing charge carriers in said semiconductor body which move through said depletion regions under the influence of said electric field are attracted towards said charged centers for an improved resolution of the signals applied across said liquid crystal layer.

4,191,453

IRIDIUM OXIDE BASED ELECTROCHROMIC DEVICES

Gerardo Beni, Westfield; Shimshon Gottesfeld, New Providence; James D. E. McIntyre, Gillette, and Joseph L. Shay, Holmdel, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 27, 1978, Ser. No. 919,485
Int. Cl.[2] G02F 1/17
U.S. Cl. 350—357 **7 Claims**



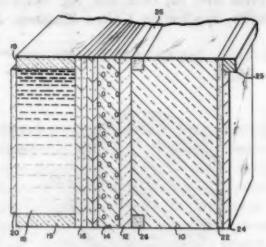
1. An electrochromic device comprising a first electrode and a second electrode contacted with an electrolyte CHARACTERIZED IN THAT said first electrode contains anodic iridium oxide, said electrolyte has a pH in the range 2 to 12 and said electrolyte has an ionic conductivity greater than 0.01 $ohm^{-1} cm^{-1}$, whereby when an electrical potential is applied between said first electrode and said second electrode a reflectivity change is produced.

4,191,454

CONTINUOUS SILICON MOS AC LIGHT VALVE SUBSTRATE

Paul O. Braatz; Jan Grinberg, both of Los Angeles; Alexander D. Jacobson, Topanga, and Michael Waldner, Woodland Hills, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 808,224, Jun. 20, 1977, abandoned.
This application Oct. 10, 1978, Ser. No. 949,840
Int. Cl.[2] G02F 1/13
U.S. Cl. 350—342 **5 Claims**



1. An alternating current liquid crystal light valve, comprising:

(a) a silicon substrate;

(b) a silicon dioxide layer formed on a surface of said substrate;

(c) light blocking means adjacent said silicon dioxide layer;

(d) light reflecting means adjacent said light blocking means;

(e) a liquid crystal layer adjacent said light reflecting means; and

(f) alternating current biasing means whereby during a part of the alternating current cycle, the voltage across the silicon substrate-silicon dioxide structure depletes said silicon substrate of its mobile charge carriers and permits charges to move from one side of the substrate to the

opposite side adjacent said silicon dioxide under the influence of the electric field set up by said biasing means.

4,191,455

MANUAL RETRIEVING MECHANISM FOR MICROFICHE READER APPARATUS OR THE LIKE

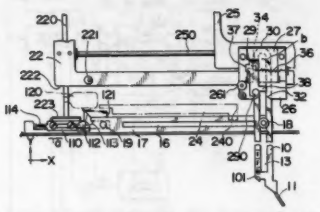
Yutaka Watanabe; Seiichi Yamagishi, both of Tokyo, and Shiro Toriumi, Machida, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 19, 1978, Ser. No. 943,902

Claims priority, application Japan, Sep. 30, 1977, 52/118015; Jun. 12, 1978, 53/80957[U]

Int. Cl.[2] G03B *23/08*

U.S. Cl. 353—27 A **10 Claims**



1. In a microfiche reader apparatus or the like including an automatic retrieving mechanism comprising a first carriage moveable in a first direction and supporting thereon a microfiche and a second carriage moveable in second direction which is orthogonal to said first direction and moveably supporting said first carriage thereon;

a manual retrieving mechanism including a stationary guiding means affixed to said apparatus and having an elongated slot and a manual retrieving lever means having an elongated slot, a pivotal shaft means engaging and being moveable along said elongated slots and said lever means being so positioned to have its elongated slot perpendicular to the elongated slot of said guiding means; and

means coupling said manual retrieving lever means with said first carriage so as to enable movements of said first and second carriages by the manual operation of said lever means.

4,191,456

OPTICAL BLOCK FOR HIGH BRIGHTNESS FULL COLOR VIDEO PROJECTION SYSTEM

Byung S. Hong, Mission Viejo; Joseph H. Colles, Oceanside; David D. Scofield, San Diego; Stephen J. Purdy, and Stephen J. Reinsch, both of Vista, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 8, 1979, Ser. No. 18,691

Int. Cl.[2] H01J *29/89*; G03B *21/00*; G02F *1/01*

U.S. Cl. 353—31 **6 Claims**

1. An improved optical block for use in a high brightness full color video projector of the type wherein a beam of collimated white light from a high intensity source is modulated with the primary color components of at least three video sources by means of a first, second and third reflection type polarization state modulation means, each of said means for spatially modulating a primary color component video image in real time, said optical block comprising:

(a) a first polarizing means positioned to receive said collimated projection light for prepolarizing said light along a first plane and a second plane, said first and second planes being mutually orthogonal and for directing said light polarized along said first plane and said light polarized along said second plane along mutually orthogonal paths;

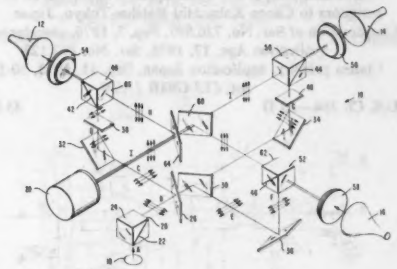
(b) means for projecting said full color image;

(c) input filter means located on a first level for separating collimated unmodulated polarized white light leaving said first polarizing means into three beams of collimated polarized light of different primary colors;

(d) relay mirror means for redirecting said three beams of collimated polarized light of different primary colors in a direction perpendicular to said first level;

(e) first, second and third wavelength-tuned polarizer/analyzers located on a second level and positioned to receive said three beams of collimated polarized light of different primary colors;

(f) said first, second and third wavelength tuned polarizer/analyzers being arrayed to direct said three beams of collimated polarized light of different primary colors to the surface of said first, second and third reflection type polarization state modulation means so that the state of polarization of the light in said beams is modulated by the primary color component video images and each reflected to one of said wavelength-tuned polarizer/analyzers to be polarization analyzed;



(g) output filter means located on a second level positioned to receive the image modulated portion of said polarization-analyzed beams so as to recombine said three beams into said full color image for projection by said means for projecting said full color image, the optical path length from said means along any of said three primary color beams to the reflection and modulation means for modulating said beam being equal to said path length along any other of said beams and said reflection and modulation means being positioned so that said projection lens means simultaneously images and superimposes the three primary color component images 55 formed separately at each of said reflection and modulation means in said respective collimated light beams to form said full color image without the interposition of any lens in the optical path between said means for projecting said full color image and said reflection and modulation means.

4,191,457

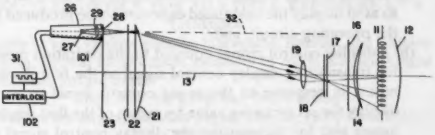
BI-DIRECTIONAL OPTICAL APPARATUS FOR ALTERING AN OPTICALLY PROJECTED MEMBER

Arthur R. Zingher, 511 Church Ave., Woodmere, N.Y. 11598

Filed Aug. 21, 1978, Ser. No. 935,709

Int. Cl.[2] G03B *21/00*

U.S. Cl. 353—44 **20 Claims**



1. In a device for illuminating a subject and projecting an image of said subject through an optical focusing systems to an

apparent image, an apparatus for performing useful work on said subject, comprising light source means directed at said apparent image for emitting a beam of writing light, means for directing said writing light from the image plane back through said optical focusing means to focus on said subject, and recording means closely adjacent to said subject for undergoing perceptible change in response to said writing light.

4,191,458

PHOTOGRAPHIC INFORMATION SETTING DISPLAY CIRCUIT

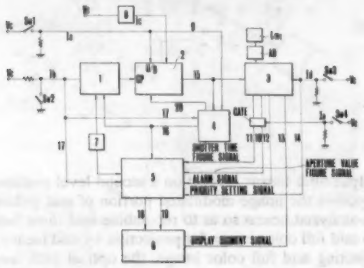
Masaharu Kawamura, Hino; Nobuaki Sakurada, Yokahama; Nobuhiko Shinoda, Tokyo; Fumio Ito, Yokohoma; Hiroyashu Murakami, Tokyo, and Tadashi Ito, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 720,597, Sep. 7, 1976, abandoned. This application Apr. 17, 1978, Ser. No. 897,123

Claims priority, application Japan, Sep. 11, 1975, 50-110727

Int. Cl.² G03B *17/20*

U.S. Cl. 354—23 D **33 Claims**



1. A photographic information display circuit for displaying photographic information comprising:

(a) pulse forming means for producing pulses,

(b) counter means for counting the pulses from the pulse forming means,

(c) manually operable exposure controlling operation means coupling the pulse forming means to the counter means for forming count control signal and for making the counter means count the pulses from the pulse forming means until an exposure value is set in the counter in response to the count control signals,

(d) a light measuring circuit for producing a digital value corresponding to the intensity of the light from the object,

(e) an operation circuit connected to the counter means and the light measuring circuit so as to produce a digital calculated exposure value on the basis of the object brightness and the exposure value set at the counter means,

(f) first display means connected to the counter means so as to display the exposure value in the counter means,

(g) second display means connected to the operating circuit so as to display the calculated exposure value produced by the operating circuit, and

(h) a display control circuit coupled to the operation means for transmitting display control signal to the first display means in response to the count control signal so as to display the set exposure value by means of the first display means and for transmitting the display control signal to the second display means so as to display the set value and the calculated exposure value when the count control signal disappears.

4,191,459

DIGITAL CAMERA SHUTTER CONTROL CIRCUIT HAVING MEMORY READ-OUT/SHUTTER OPENING SYNCHRONIZATION

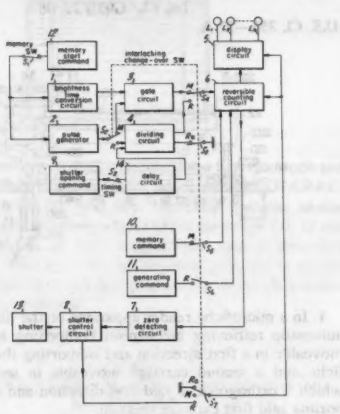
Takeo Saito; Youichi Seki, both of Chiba, and Kiyoshi Kitai, Tokyo, all of Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Continuation of Ser. No. 499,982, Aug. 23, 1974, abandoned. This application Jun. 30, 1976, Ser. No. 701,020

Claims priority, application Japan, Aug. 24, 1973, 48-95006

Int. Cl.² G03B *7/08*

U.S. Cl. 354—23 D **6 Claims**



1. In a camera shutter control circuit of the type having means for developing a plurality of pulses the number of which is representative of an exposure time; a counting circuit for counting and storing the number of pulses representative of an exposure time; and read-out means for reading-out the number of stored pulses stored in said counting circuit to control an exposure time; the improvement which comprises:

said read-out means comprising means responsive to a reset signal for rendering said reading-out means inoperative; and

reset means for normally developing a reset signal to render said reading-out means inoperative and operable for terminating the reset signal after a variable selectible time delay to render said read-out means operative, said reset means including means operable for selecting said time delay, and said reset means renderable operative upon initiation of shutter opening to terminate the reset signal after the selected time delay and initiate reading-out of the stored pulses to control an exposure time, whereby selection of the reset means time delay to equal the shutter opening time is effective to synchronize shutter opening with the initiation of reading-out of the stored pulses and thereby eliminate exposure time error due to premature or late initiation of reading-out of the stored pulses.

4,191,460

CAMERA WITH AUTOMATIC FOCUS ADJUSTMENT DEVICE

Makoto Fujiki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 22, 1978, Ser. No. 962,884

Claims priority, application Japan, Dec. 14, 1977, 52-150340

Int. Cl.² G03B *3/10*

U.S. Cl. 354—25 **33 Claims**

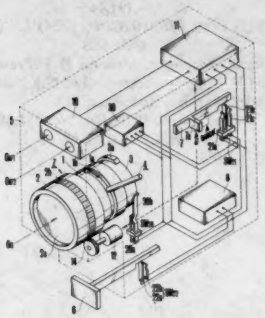
1. A camera comprising:

(a) a zoom lens mechanical mounting capable of selectively photographing in an ordinary zoom range and a macro-zoom range;

(b) photographing range changeover means for changing over said zoom range of said zoom lens mechanical mounting;

(c) automatic focus adjustment means for automatically controlling focus adjustment of said zoom lens in accordance with a distance from said camera to an object to be photographed, said means having:

a distance measuring optical system having an optical axis offset from that of said zoom lens; and



a focus adjusting device for detecting the camera-to-object distance by an incident light beam from said distance measuring optical system and for performing focus adjustment of said zoom lens;

(d) drive means for driving said camera; and

(e) control means responsive to changeover operation by said changeover means to said macro-zoom range for causing said drive means to be inoperative.

4,191,461

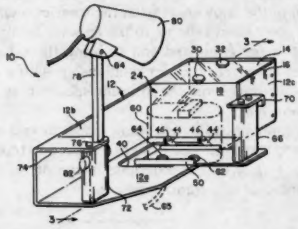
CAMERA JIG FOR UNDERWATER STEREOSCOPIC PHOTOGRAPHY

John Mittleman; Charles O. Warrell, both of Panama City, and Ronald S. Peterson, Panama City Beach, all of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 16, 1979, Ser. No. 39,990

Int. Cl.² G03B *17/08*

U.S. Cl. 354—64 **10 Claims**



1. Apparatus for use in taking close-up underwater stereoscopic photographs, said apparatus comprising in combination:

a rigid frame including a base portion and having front and rear ends;

a fluid tight box disposed at said front end of said frame and comprising spaced front and rear transparent plates extending transversely of the front to rear central axis of said base portion;

a transparent liquid filling said box;

a camera support member extending transversely of said base portion rearwardly of said rear transparent plate;

an underwater camera, mounted on said support member, and looking through said rear transparent plate, said transparent liquid, and said front transparent plate;

connecting means, between said camera support and said base portion, for guiding lateral movement of said camera support member and said camera between first and second predetermined positions from which said camera has first and second fields of view laterally displaced from one another by said predetermined distance; and

handle means for use in manually supporting said apparatus and for effecting said lateral movement of said camera support member and said camera between successive photographic exposures by said camera.

4,191,462

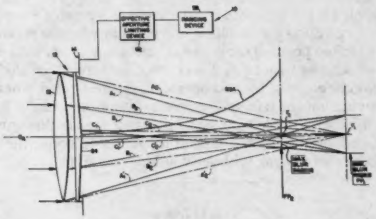
FIXED FOCUS EXPOSURE CONTROL APPARATUS WITH REVERSE SPHERICAL ABERRATION CORRECTIVE CHARACTERISTIC

Bruce K. Johnson, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 24, 1978, Ser. No. 899,270

Int. Cl.² G03B *3/04, 15/03*

U.S. Cl. 354—139 **14 Claims**



1. In a camera including means for defining a focal plane and an effective aperture control arrangement operatively disposed with respect to said focal plane, the improvement comprising a lens arrangement operatively disposed with respect to said effective aperture control arrangement and fixedly positioned with respect to said focal plane during different exposure operations in which image-forming light rays from subjects, located at different specific locations within a given range of distances from said camera, are at different times respectively focused at said focal plane, said lens arrangement being configured to include a reverse spherical abberation corrective characteristic effective to substantially reduce the average size of the effective circles of confusion associated with each of the images of the different said subjects as formed at said focal plane by said lens arrangement in combination with said effective aperture control arrangement wherein said effective aperture control arrangement includes a shutter arrangement of the type capable of selectively providing different maximum effective aperture sizes during different exposure operations and means for varying the maximum effective aperture size for different exposure operations as a function of camera-to-subject distances so that the sizes of said maximum effective apertures increase as the camera-to-subject distances increases.

4,191,463

COUNTER DEVICE FOR MULTIPLE EXPOSURE IN A CAMERA

Fumio Urano, Omiya; Keisuke Haraguchi, Ranzan, and Akihiro Arai, Urawa, all of Japan, assignors to Asahi Kogaku Kogyo Kaisha, Tokyo, Japan

Filed Jun. 16, 1978, Ser. No. 916,386

Claims priority, application Japan, Jun. 20, 1977, 52-80759[U]

Int. Cl.² G03B *17/36*

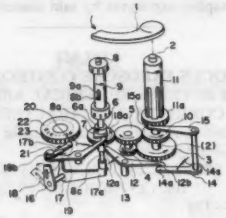
U.S. Cl. 354—217 **5 Claims**

1. A camera of the type having a multiple exposure function,

film winding means on which the camera film is wound and operating means for transmitting motion through a winding operation transmitting means to said film winding means to thereby cause said film to be wound, wherein the improvement comprises:

a counter device for displaying the number of exposures taken per frame of film;

a counter advance means engageable with said counter device and said winding operation transmitting means for advancing said counter device in response to movement of said operating means; and



switch means movable by the camera operator between a first position for disabling said counter advance means and a second position for enabling said counter advance means while simultaneously preventing movement of said film winding means by said operating means so that when said switch means is in said second position the counter device may be advanced by said operating means through said winding operation transmitting means to count the number of exposures without winding said film.

4,191,464

BLADE TYPE FOCAL PLANE SHUTTERS

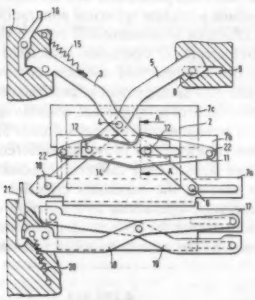
Heinz Schulze, Dresden, German Democratic Rep., assignor to Veb Pentacon Dresden Kamera und Kinowerke, Dresden, German Democratic Rep.

Filed Sep. 8, 1977, Ser. No. 831,651

Claims priority, application German Democratic Rep., Sep. 13, 1976, 194762

Int. Cl.² G03B *9/40*

U.S. Cl. 354—246 **6 Claims**



1. A blade-type focal plane shutter for a camera of the type having an exposure determining system therein, said shutter comprising:

(a) a plurality of opening blades for movement in front of a film gate,

(b) a drive lever for the opening blades, and

(c) means for diffusedly reflecting light positioned parallel to the focal plane and operatively connected to said drive lever, which reflecting means before the commencement of the exposure operation lies in front of the opening blades in the film gate and is movable out of the film gate during the opening movement of the opening blades in a path parallel to the focal plane, said reflecting means together with the opening blades forming a reflection factor which corresponds to the mean reflection factor of different film types.

4,191,465

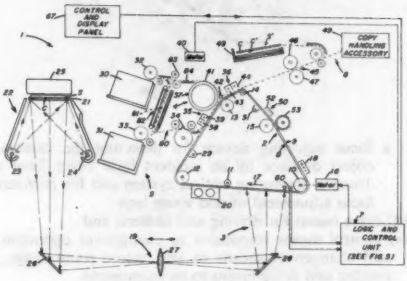
APPARATUS FOR PRODUCING SIMPLEX OF DUPLEX COPIES

Elmer E. Boase, Rochester; Alphonse B. DiFrancesco, Penfield, and Stuart F. Ring, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 3, 1978, Ser. No. 921,286

Int. Cl.² G03G *15/00*

U.S. Cl. 355—3 SH **16 Claims**



1. In apparatus for producing simplex or duplex copies and including a movable image transfer member upon which unfixed, transferable images may be formed and image transfer means for transferring the transferable images from the transfer member to copy sheets, the improvement comprising:

vacuum member means located adjacent to and operable in synchronism with said transfer member for moving:

when duplex copies are being made, in a first direction to separate by vacuum attraction from the transfer member a copy sheet to one side of which a first transferable image has been transferred by said transfer means from said member, and then in a second direction following separation of the copy sheet from the transfer member to invert the copy sheet relative to the transfer member while said first image is unfixed and to bring the other side of the copy sheet into transfer relationship with a second transferable image on the transfer member at said transfer means; and

when simplex copies are being made, in said second direction to bring one side of a copy sheet into transfer relationship with a first transferable image on said transferable member at said transfer means.

4,191,466

ILLUMINATING SYSTEM FOR COLOR ENLARGEMENT OR COPYING EQUIPMENT

Mario Gandini, Brixen, Italy, assignor to Durst A.G. Fabrik Fototechnischer Apparate, Bozen, Italy

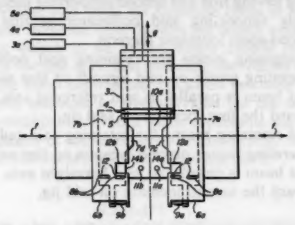
Filed Nov. 9, 1978, Ser. No. 959,253

Int. Cl.² G03B *27/76*

U.S. Cl. 355—35 **12 Claims**

1. In an illuminating system for color enlargement or copying having a filter of maximum density continuously insertable in a predetermined direction into a copy light beam passing through an aperture, the improvement comprising: a shutter

positioned for insertion into said light beam in a direction normal to the direction of insertion of said filter, said shutter



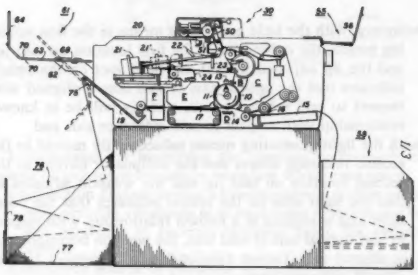
having a shape that varies as the shutter is inserted into the light beam to thereby vary the shape of said aperture.

4,191,467

DUAL MODE CATCH TRAY

Richard A. Schieck, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 4, 1979, Ser. No. 27,183
Int. Cl.² G03B *27/62*
U.S. Cl. 355—75 **11 Claims**



1. A dual purpose document and copy sheet receptacle for receiving copies produced from a reproducing apparatus when said receptacle is used in a first mode of operation and for receiving copied originals when said receptacle is used in a second mode of operation,

said receptacle comprising a first support surface for receiving copies produced when said receptacle is used in said first mode of operation and a second support surface for receiving copied originals when said receptacle is used in said second mode of operation,

said receptacle being pivotally mounted to provide first and second support surfaces when used in said first and second modes of operation respectively.

4,191,468

RANGE FINDING FIBERSCOPE

John F. Scully, Spencer, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Jun. 21, 1978, Ser. No. 917,612
Int. Cl.² G01C *3/12*
U.S. Cl. 356—17 **10 Claims**

1. A range finding instrument comprising:

a pair of image-conducting bundles of optical fibers each having a distal image-receiving face and a proximal image-emitting face, said proximal faces being juxtapositioned and said distal faces being fixedly spaced a predetermined distance apart in a first plane with axes thereof extending substantially parallel to one another;

light deflecting means in aligned spaced relationship with a first of said distal faces, said deflecting means intersecting the axis of said first face, the point of said intersection being in a second plane parallel to said first plane, said second plane establishing a reference from which range finding measurements may be made;

a first objective lens means axially aligned between said deflecting means and said first distal face for focusing an image of a remote object upon said first face;

second objective lens means axially aligned with the second of said distal faces for focusing an image of said same

remote object upon said second face, centering of said image on said second face being accomplished by movement of said instrument;

means for independently angularly adjusting said light deflecting means relative to said first distal face to center said image of said remote object upon said first distal face; and

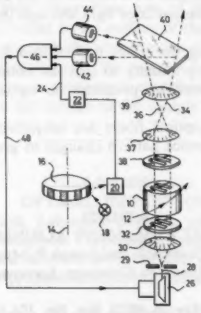
means for determining extent of angulation of said light deflecting means for determination of range of said object from said second plane.

4,191,469

INTERFERENCE OPTICAL SENSING DEVICE FOR A CENTRIFUGE

Josef Flossdorf; Henning Schillig, and Klaus-Peter Schindler, all of Brunswick, Fed. Rep. of Germany, assignors to Gesellschaft fur biotechnologische Forschung m.b.H., Brunswick, Fed. Rep. of Germany

Filed Dec. 28, 1977, Ser. No. 865,197
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1977, 2702275
Int. Cl.² G03B *27/32*; G01B *9/02*
U.S. Cl. 356—23 **6 Claims**



1. An interference optical measuring device comprising a light source, a light beam splitter, two component optical beam paths, means for sensing radiation in said optical beam paths, a centrifuge having a multiple hole rotor, said rotor having holes for receiving sample cells or a counter balance, said rotor being arranged in said optical paths so that on rotation of the rotor said cells and counter balance successively pass through the component optical beam paths and in at least one sampling position two samples in a selected cell simultaneously lie in the two component optical beam paths, means for producing a position signal indicating that said selected cell is located in

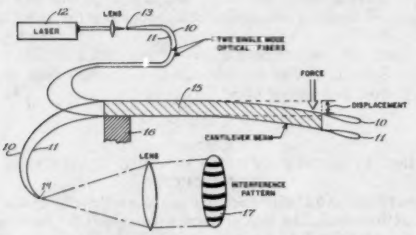
said sampling position, and control means for activating said measuring device when said samples are in said sampling position, characterized in that said light source includes means for emitting a control light between said activation of said measuring device, in that there are provided control light detecting means, positioned in said component optical paths at positions in said paths on the other side of said rotor with respect to said control light source, said detecting means for providing respective first and second output signals when said first and second component beam paths are optically coupled through a hole in said rotor, and in that the position signal and the first and second output signals are passed to a coincidence circuit, which activates said measuring device when all three signals arrive simultaneously.

4,191,470

LASER-FIBER OPTIC INTERFEROMETRIC STRAIN GAUGE

Charles D. Butter, Cologne, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 18, 1978, Ser. No. 943,588
Int. Cl.[2] G01B *11/16*
U.S. Cl. 356—35.5 **4 Claims**



4. Optical strain gauge apparatus comprising:

first and second single mode optical fibers adapted to be fastened, respectively, to different positions on strainable beam means, the different positions having different strains one from the other;

laser means positioned with respect to one end of said fibers to transmit coherent laser light through the length of said fibers; and

means positioning the other end of said first and second fibers in close proximity so that the coherent laser light emanating therefrom produces an optical interference pattern,

whereby when optical fibers are subjected to strain said optical interference pattern changes to give a measure of strain.

4,191,471

AIRCRAFT ARMAMENT ALIGNMENT

Henry C. Courten, Commack, and Joseph P. Mattal, Smithtown, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed May 24, 1972, Ser. No. 256,421
Int. Cl.[2] G01B *11/26*; G01C *1/06*
U.S. Cl. 356—154 **6 Claims**

1. Apparatus for aligning the boresight axis of a weapon carried by an aircraft with respect to a reference axis on said aircraft including

a collimator comprising a housing, an objective lens, a translucent screen, a reticle on said screen, and optical elements between said lens and said screen mounted in said housing, the angular relationship between the optical axis of said objective lens and a collimated light beam received by said lens being indicated by the position of a light spot in said reticle,

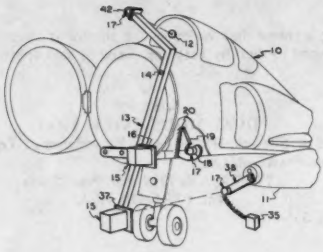
means for generating a collimated light beam,

a jig temporarily and adjustably attachable to said aircraft,

said jig having first and second supporting means for alternatively supporting said collimator at first and second spaced-apart locations thereon,

first retaining means for retaining said collimated light-generating means on said aircraft so that said collimated light beam is parallel to said reference axis and directed toward the first location on said jig,

second retaining means for retaining said collimated light generating means on said weapon so that said collimated light beam is parallel to said boresight axis, and directed toward the second location on said jig,



whereby, with the light generating means in the first retaining means, the collimator at the first location on said jig, and the jig adjusted so that the light spot on the reticle indicates that the optical axis of said lens is aligned with respect to said reference axis, said jig will be in known relationship with respect to said reference axis and

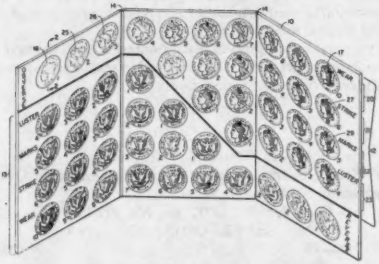
with the light-generating means subsequently moved to the second retaining means and the collimator moved to the second location on said jig and the weapon adjusted so that the light spot on the reticle indicates that the boresight axis is aligned in a known relationship with respect to said optical axis of said lens, the weapon boresight axis is aligned at a known relationship with respect to said aircraft reference axis.

4,191,472

APPARATUS FOR THE ELEVATION OF COINS

Derek Mason, 351 Linda Way, Mill Valley, Calif. 94942

Filed Oct. 17, 1977, Ser. No. 842,777
Int. Cl.[2] G02B *27/00*; G09B *25/00*
U.S. Cl. 356—243 **28 Claims**



1. A method for determining the relative numismatic quality of a test coin of a given mint mark and date comprising the steps of: forming a plurality of facsimile coin sets, each set comprising a plurality of facsimile coins, the facsimile coins in each set exhibiting only one given coin defect to varying quantitative extents while being substantially defect-free in all other

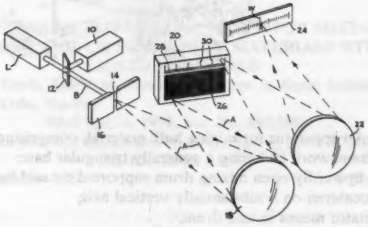
respects; arranging the facsimile coins in each set in relatively close proximity to each other; assigning to each facsimile coin in each set a value representative to the extent to which such coin exhibits the defect represented by the corresponding set; comparing the test coin with the facsimile coins in each set; determining the facsimile coin in each set which exhibits the corresponding defect to an extent which closest resembles such defect on the test coin; and summing the values assigned to the facsimile coins determined to closest resemble the test coin to thereby establish an overall value for the test coin; whereby the established overall value represents the relative numismatic quality of the test coin as determined by the extent to which said defects are present on the test coin.

4,191,473

METHOD OF AND APPARATUS FOR MEASURING THE ABSOLUTE WAVELENGTH OF A SOURCE OF UNKNOWN FREQUENCY RADIATION

Theodor W. Hansch, 15100 Oak Creek Dr., Apt. 405, Palo Alto, Calif. 94304

Filed Jan. 9, 1978, Ser. No. 837,017
Int. Cl.² G01J *3/02*; G02B *5/18*
U.S. Cl. 356—300 **13 Claims**



1. Apparatus for measuring the absolute wavelength of a source of unknown frequency radiation which comprises

a diffraction grating having a predetermined grating pattern with periodic variations in at least some of its grating lines and arranged to receive radiation from the radiation source,

a reference source of radiation of known wavelength (frequency) arranged to direct its radiation against said diffraction grating, and

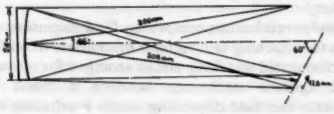
means for imaging the diffracted radiation from both sources, the imaged radiation from said reference source providing a calibration scale.

4,191,474

SPECTROGRAPH FOR AN EXTENDED SPECTRAL FIELD IN WHICH PARTIAL PLANAR DIFFRACTION SPECTRA ARE SUCCESSIVELY FORMED IN THE SAME PLANE

Genevieve Passereau, Bourg la Reine, France, assignor to Instruments S.A., Paris, France

Filed Jun. 30, 1978, Ser. No. 920,995
Claims priority, application France, Jul. 8, 1977, 77 21098
The portion of the term of this patent subsequent to May 2, 1995, has been disclaimed.
Int. Cl.² G01J *3/18*
U.S. Cl. 356—305 **1 Claim**



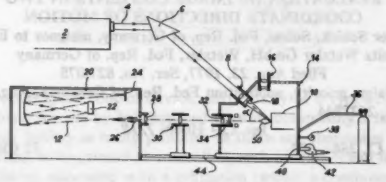
1. A spectrograph for an extended spectral field, including an inlet slot for defining a source of light to be analyzed, and a dispersive system consisting solely of a concave holographic grating, said grating having registration points with coordinates in relation with the coordinates of the light source to be analyzed to produce, for each of respective different bands of wavelengths which in total cover the entire range of wavelengths of the spectral field to be analyzed, tangential focal lines for different wavelengths which are disposed in the same plane, said grating being rotatable around an axis passing through the center of the grating and perpendicular to a plane passing through the center of the inlet slot whereby respective partial planar diffraction spectra are successively formed in the same plane when rotating the grating around said axis.

4,191,475

PROCESS AND APPARATUS FOR ANALYZING A SAMPLE BY EMISSION SPECTROGRAPHY

Michel Sourrouille, Bagnols, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 7, 1977, Ser. No. 785,554
Claims priority, application France, Apr. 15, 1976, 76 11132
Int. Cl.² G01J *3/30*
U.S. Cl. 356—318 **11 Claims**



1. A process for the analysis of a sample by emission spectrography according to which a laser beam is directed onto a sample with an intensity which is sufficient to volatilize and excite the constituent bodies of the sample at the impact point of the laser beam and the plasma created by the volatilized and excited bodies is observed by means of a spectrograph, wherein the laser beam is directed onto the surface of the sample in accordance with an angle of impact of α greater than 10° and the optical observation axis of the spectrograph is oriented perpendicular to the surface of the sample, said optical axis passing through the impact point of the laser beam on the sample, the vicinity of the sample during volatilization being subjected to a continuous electrical field substantially perpendicular to the surface of the sample.

4,191,476

OPTICAL INSPECTION

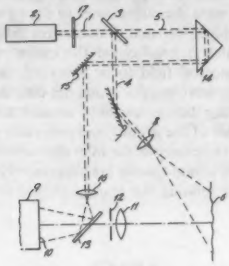
Harry C. Pollard, Leicester, England, assignor to National Research Development Corporation, London, England

Filed Mar. 13, 1978, Ser. No. 886,130
Claims priority, application United Kingdom, Mar. 15, 1977, 10884/77
Int. Cl.² G01B *9/02*
U.S. Cl. 356—349 **14 Claims**

1. A method of optical inspection of a surface, the method comprising:

forming two patterns of illumination independently on a photosensitive screen respectively by means of light of two different wavelengths, said patterns being formed in the same manner and each of them resulting from the irradiation of said screen with light derived from a coherent source and consisting of first and second interfering beams, said first beam for each of said patterns being

constituted by light scattered from said surface and imaged on to said screen; and



deriving from said screen a video signal representing the spatial variations in the sum of the intensities in said two patterns of illumination.

4,191,477

PROCESS AND APPARATUS FOR THE SEPARATE EVALUATION OF IMAGE CONTENTS IN TWO COORDINATE DIRECTIONS OF MOTION

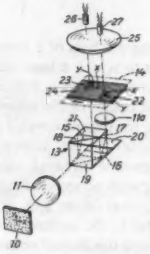
Dieter Schick, Solms, Fed. Rep. of Germany, assignor to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Aug. 23, 1977, Ser. No. 827,075

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1976, 2637844

Int. Cl.² H04N *7/18*

U.S. Cl. 356—373 **12 Claims**



5. An apparatus for separately measuring the image contents of an object in two coordinate directions of motion, said apparatus comprising:

an optical element for receiving the image to be measured;

a beam splitting means for orthogonally splitting the image received;

a mirror means for reflecting the split images received from the beam splitting surface; and

a correction grid arranged to receive said images reflected by said mirror means, said grid being constructed such that it is periodic in at least one orthogonal direction;

said beam splitting means and said mirror means formed by a prism combination, said prism combination comprising first, second, third and fourth quadratic prisms;

said prisms being arranged such that the base of said first prism is in contact with the base of said second prism to form said mirror means, one cathetus of said third prism being arranged against one cathetus of said first prism and one cathetus of said fourth prism being arranged against one cathetus of said second prism such that a second cathetus of said third prism and a second cathetus of said fourth prism are each located in substantially the same plane and such that said third and fourth prisms are arranged along adjacent sides of said first and second prisms.

4,191,478

MIXING APPARATUS FOR CONCRETE OR OTHER BULK MATERIAL

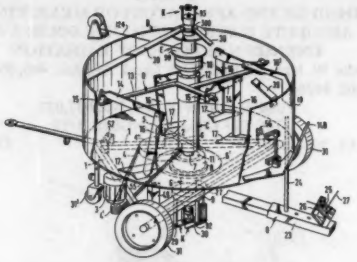
Viktor Zupančič; Franc Zupančič, and Tomaz Zupančič, all of Cesta v gorice 10/D, 61000 Ljubljana, Yugoslavia

Filed Feb. 7, 1978, Ser. No. 875,881

Claims priority, application Yugoslavia, Feb. 7, 1977, 314/77

Int. Cl.² B28C *7/02, 7/14*

U.S. Cl. 366—39 **19 Claims**



1. An apparatus for mixing bulk material, comprising:

a framework including a generally triangular base;

an upwardly open mixing drum supported on said base and centered on a substantially vertical axis;

agitator means in said drum;

mechanism for relatively rotating said agitator means and said drum, said mechanism including main shaft means centered on said axis and provided with ancillary force-transmitting means forming part of a power train selectively actuatable for the operation of associated material-handling equipment; and

drive means for rotating said main shaft means to impart relative rotation to said drum and said agitator means, said drive means including a motor secured to said framework on one side of said base, an auxiliary shaft journaled on another side of said base, a first step-down transmission linking said motor with said auxiliary shaft, and a second step-down transmission linking said auxiliary shaft with said main shaft means.

4,191,479

SLUDGE AGITATING APPARATUS

William D. Shuck, Indianapolis; Frederick D. Lind, Whiteland, and John W. Cole, Indianapolis, all of Ind., assignors to Tousley-Bixler Construction Co. Inc., Indianapolis, Ind.

Filed Jul. 3, 1978, Ser. No. 921,257

Int. Cl.² B01F *15/00*

U.S. Cl. 366—101 **28 Claims**

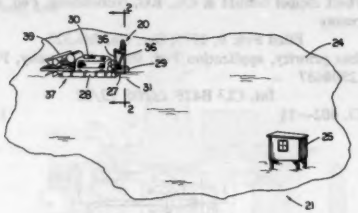
1. A sludge agitating apparatus for conditioning sludge so that it can be pumped from a lagoon, and comprising:

a support platform having means for floating on a body of water;

an agitator mechanism comprising fluid dispensing means;

means for attaching said agitator mechanism to said support platform, said attaching means arranged for movement of said agitator mechanism between a raised position wherein the fluid dispensing means is adjacent said support platform, and a submerged position substantially below said support platform;

a fluid supply source coupled to said agitator mechanism; and



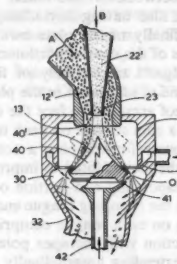
said fluid dispensing means including a plurality of fluid outlets for release of fluid received by said agitator mechanism from said fluid supply source.

4,191,480

CONTINUOUS FLOW STATIC MIXER FOR MIXING POWDER AND/OR SUSPENSION MATERIALS WITH LIQUID MATERIALS

Hans Hiorth, Lierbyen, Norway, assignor to Dyno Industrier A.S, Oslo, Norway

Filed Apr. 4, 1978, Ser. No. 893,308
Claims priority, application Norway, Apr. 4, 1977, 771200
Int. Cl.² B01F *15/00*
U.S. Cl. 366—336 **6 Claims**



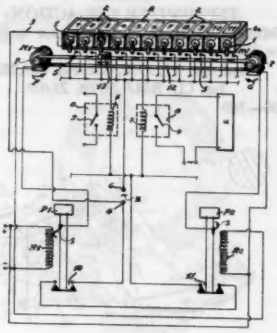
1. A static mixer for mixing in a continuous flow powder and/or suspension materials with liquid materials, and especially for intermixing the material components of an explosive, said mixer comprising a toroidal mixing chamber, an inlet for each powder and/or suspension component centrally and coaxially disposed in the chamber, at least one spreader body having a substantially conical spreading surface centrally disposed and in a spaced and downstream relationship to the powder/suspension inlet(s), an annular inlet in the chamber for each liquid component, each said powder/suspension inlet being in the form of a pipe nozzle communicating with a pressure vessel containing fluidized powder components and/or suspension components, each said liquid inlet being in the form of an annular conical slit-nozzle communicating with a liquid-containing pressure vessel, each said conical spreading surface and each said conical slit-nozzle being so axially and angularly disposed relative to each other such that in operation of the mixer the high speed conical powder/suspension sprays leaving each said conical spreading surface hit the high speed conical liquid sprays from each said conical slit-nozzle in a common unsupported or floating circular mixing zone in said mixing chamber.

4,191,481

ANALOGICAL CONTROL DEVICE FOR A TYPEWRITING MACHINE TO BE USED BY HANDICAPPED PERSONS

Jean-Claude Gabus, Hauterive, Switzerland, assignor to Carba S.A., Berne, Switzerland

Filed Feb. 14, 1978, Ser. No. 877,770
Claims priority, application Switzerland, Nov. 23, 1977, 14332/77
Int. Cl.² B41J *5/30*
U.S. Cl. 400—87 **7 Claims**



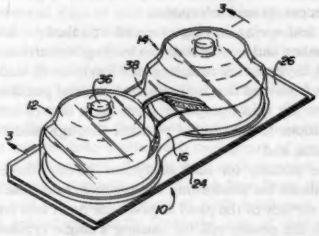
1. Analogical control device, particularly of a typewriting machine, for use by handicapped persons comprising a linear display having as many positions as there are characters and functions to be printed or controlled, each character and function being associated with a utilization circuit; a continuously variable speed scanning device of said display to select a desired character or function; and means whereby stopping the scanning on a given position causes the energization of the corresponding utilization circuit.

4,191,482

PRINTING RIBBON PACKAGE HAVING INK ABSORBING MEANS

Carl W. Ploeger, 1404 Dewey Ave., North Bellmore, N.Y. 11710

Filed Nov. 17, 1977, Ser. No. 852,253
Int. Cl.² B41J *33/14*
U.S. Cl. 400—207 **10 Claims**



1. A printing ribbon package comprising:

(a) at least one spool having a hub, a printing ribbon wound around said hub, said spool containing an ink reservoir, a flexible pad supported by said spool in a position for transmitting ink to an edge of said ribbon, a wick extending from said pad to said reservoir by way of a constriction in the spool,

(b) a housing, said spool being disposed within said housing,

(c) means in said housing in contact with said exposed por-

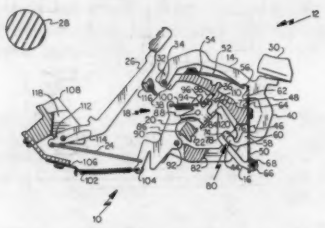
tion of said pad for absorbing ink discharged from said pad while said spool is in said housing.

4,191,483

TYPEWRITER KEY ACTION

Hans W. Mueller, Cortland, N.Y., assignor to SCM Corporation, New York, N.Y.

Filed Apr. 17, 1978, Ser. No. 896,952
Int. Cl.[2] B41J *23/06, 25/02*
U.S. Cl. 400—369 **1 Claim**



1. A key action for a typewriter including a typebar pivotally mounted for movement from a rest position to a print position, an actuating means connected to the typebar to effect the printing movement of the typebar, a power roll rotatably mounted in the typewriter for engagement with a pivotal pawl of the actuating means to power the typebar printing movement, the improvement comprising:

a support member fixed in the typewriter;

a keylever pivotally mounted on said support member for movement from a rest position to a first depressed position and beyond to a repeat depressed position;

an elongated interposer mounted on a shaft fixed in the typewriter, said interposer movable from an initial position to a first and second pivoted position;

means connecting said keylever to said interposer for direct control of the movement of said interposer in response to movement of said keylever, said connecting means including an abutment on said keylever closely received within a recess on said interposer;

a flat leaf spring having one end attached to said support member and horizontally extending therefrom to engage said keylever for restoring said keylever to said rest position from said first and repeat depressed positions, and for restoring said interposer from each one of said pivoted positions to said initial position through said connecting means; and

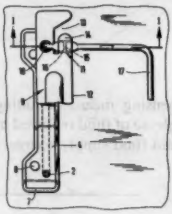
a nose portion on said interposer having three operable positions for controlling the typebar, said nose engages a top surface of the pawl to pivot the pawl into engagement with the power roll for causing a single typebar printing movement in response to keylever movement to said first depressed position, said nose abuts the pawl below said top surface to avoid pivoting the pawl to prevent further actuation of the typebar when the typebar remains in said first depressed position, and said nose engages the pawl below its pivot to repeatedly pivot the pawl into engagement with the power roll for causing repeat typebar printing movement in response to keylever movement to said repeat depressed position and when the keylever remains in said repeat depressed position.

4,191,484

DOCUMENT FILES

Herbert Zippel, Altdorf, Fed. Rep. of Germany, assignor to Herbert Zippel GmbH & Co., KG, Nuremberg, Fed. Rep. of Germany

Filed Feb. 9, 1976, Ser. No. 656,325
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1975, 2506637
Int. Cl.[2] B42F *13/06, 13/08*
U.S. Cl. 402—15 **1 Claim**



1. A quick release clamping mechanism for a document file, comprising:

a flexible and resilient hollow tube of plastic having a central portion and two end portions,

means for anchoring said central portion of the tube to the file, and

an elongate clamping plate defining two holes for receiving end portions of the tube and spaced longitudinally of the plate by a distance corresponding to that between holes punched in documents to be held by the file and a central portion located between the two holes,

the clamping plate also having two clamping tongues extending longitudinally of the plate away from opposite longitudinal ends of the central portion of the plate, each tongue being aligned transversely of the plate with a corresponding one of said holes in the plate and defining, on the face thereof arranged to face the documents when held by the file, a cam surface on each tongue defining a tube trapping recess for trapping a corresponding end portion of the tube and adapted to improve the wedging effect on a corresponding end portion of the tube when wedged between the clamping tongue and the documents, said cam surface on each tongue comprising a rib of triangular cross section with the apex pointing toward the documents and extending longitudinally of the clamping plate, and two ridges located at opposite ends of said rib and extending transversely of said rib, each ridge being of greater height, in a direction extending perpendicularly of the plate, than its corresponding rib.

4,191,485

APPARATUS FOR SECURING A WHEEL TO A ROTATABLE SHAFT OF A TURBO-MACHINE

Norman A. Samurin, Greensburg, and William A. Straslicka, Norvelt, both of Pa., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 30, 1978, Ser. No. 956,170
Int. Cl.[2] B63H *1/20*
U.S. Cl. 403—15 **2 Claims**

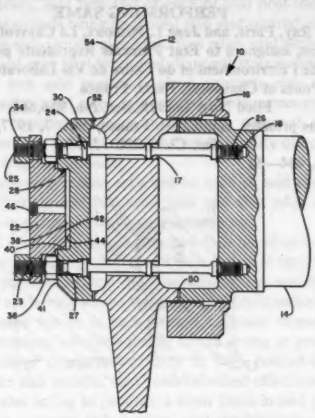
1. Apparatus for securing a wheel to a rotatable shaft of a turbomachine comprising:

an end cap forming one end of said wheel and including an axially extending flange defining a chamber;

coupling means connecting the other end of said wheel to one end of said shaft for rotating the wheel with the shaft;

a plurality of connecting means extending axially through aligned apertures formed in said wheel and said end cap, with one end of said connecting means being positively secured to said one end of said shaft;

a movable piston slidably mounted within said chamber and connected to the unsecured ends of said connecting means; and



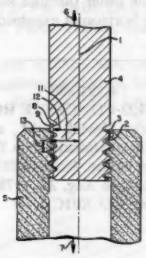
force generating means for moving said piston within said chamber relative to said end cap for stretching said connecting means and for simultaneously compressing said wheel between said shaft and said end cap.

4,191,486

THREADED CONNECTIONS

John F. Pelton, Yorktown Heights, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Sep. 6, 1978, Ser. No. 940,006
Int. Cl.² F16B *21/20*
U.S. Cl. 403—28 **8 Claims**



1. In a threaded connection to be loaded in an axial direction, said connection comprising two pieces (i) having coincidental axes and (ii) having different coefficients of thermal linear expansion wherein one piece is a threaded male piece and the other piece is a threaded female piece.

the improvement comprising providing, at ambient temperature, a taper such that the change in radial clearance per unit of length between the opposing threads of each piece is equal to the expression $A\Delta T \tan \theta$ wherein:

A = the difference in the coefficients of thermal linear expansion of the materials of which each piece is comprised in the axial direction;

ΔT = the operating temperature of the connection minus ambient temperature; and

θ = the acute angle formed by the loaded face of the thread of either piece with the axes

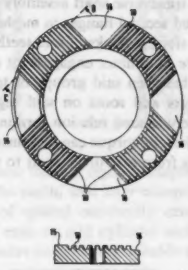
said radial clearance increasing in the direction of the loading of the piece having the higher coefficient of thermal linear expansion.

4,191,487

TRANSMISSION SHAFT INDEXING COUPLING

Josef Schultenkämper, Essen, Fed. Rep. of Germany, assignor to Gelenkwellenbau GmbH, Essen, Fed. Rep. of Germany

Filed Mar. 1, 1978, Ser. No. 882,373
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1977, 2715639
Int. Cl.² F16D *1/00*; F16L *23/00*
U.S. Cl. 403—337 **2 Claims**



1. For use in a transmission shaft assembly comprising an axially extending drive shaft, an axially extending output shaft spaced from and in alignment with said drive shaft, an axially extending intermediate connecting shaft located between and in axial alignment with said drive shaft and output shaft, said intermediate shaft having a first end adjacent to and spaced from said drive shaft and a second end adjacent to and spaced from said output shaft, a first universal joint connected to the first end of said intermediate shaft and a second universal joint connected to the second end of said intermediate shaft, and means for detachably and rigidly connecting said first universal joint to said drive shaft and said second universal joint to said output shaft, wherein the improvement comprises that said means for detachably and rigidly connecting comprises a pair of couplings, one for connecting said drive shaft and said first universal joint and the other for connecting said output shaft and said second universal joint, each coupling of said pair of couplings comprises a first flange secured to one of said drive shaft or said output shaft and a second flange secured to one of said first universal joint or said second universal joint, said first and second flanges each having a face extending substantially perpendicularly of the axial direction of said intermediate shaft, each said face on said first and second flanges disposed in facing and mating relation to each other, each said face having two groups of teeth projecting therefrom with the teeth extending from the roots to the crests thereof in the axial direction of said intermediate shafts, each said group of teeth comprising a pair of segments of teeth with each segment located on a diametrically opposite side of said face from the other segment in said pair, said segment of teeth having an radially inner edge spaced outwardly from the axis of said face on which said segment is formed and a radially outer edge, each said segment of teeth on one said face being in meshed engagement with one said segment of teeth on the other face, said segments of teeth on each said face being spaced angularly apart about the axis of said intermediate shaft, said teeth in each said segment disposed in parallel relation and extending chordally across said face relative to the axis of said intermediate shaft, each of said teeth having the crests and roots thereof extending perpendicularly to the axis of said intermediate shaft and having a pair of opposite flanks sloping outwardly from the crest to the roots of said tooth, said teeth in adjacent said segments on each said face being disposed in substantially

perpendicular relation, adjacent said segments of teeth on said face being spaced apart from a sector-like shaped planar surface, one of said faces having three raised said planar surfaces located in the plane of the crests of said teeth located thereon and one recessed said planar surface located in the plane of the roots of said teeth located thereon and the other said face having three recessed said planar surfaces located in the plane of the roots of said teeth thereon and one raised said planar surface located in the plane of the crests of said teeth located thereon so that said raised and recessed planar surfaces intermesh and align said segments of teeth and afford alignment of the transmission shaft assembly and also assure after disassembly and reassembly that the same angular relationship between the parts of the transverse shaft assembly are maintained, and with said first and second flanges in meshed engagement with one another the sloping flanks of said teeth in said segments of teeth thereon are in contact engagement and said juxtaposed planar surfaces between said groups of teeth and said juxtaposed tooth crests and roots on said segments of teeth are disposed in closely spaced relation forming a clearance space therebetween whereby torque can be transmitted through each of said couplings from said drive shaft to said output shaft.

4,191,488

SECUREMENT ARRANGEMENT FOR BICYCLE BEARING ASSEMBLY

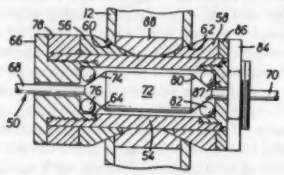
Harry Bickerton, Welwyn, England, assignor to Harry Bickerton Limited, Welwyn, England

Filed May 27, 1977, Ser. No. 801,364

Claims priority, application United Kingdom, May 23, 1977, 21703/77

Int. Cl.² F16B 2/14; B62M 3/00

U.S. Cl. 403—370 **4 Claims**



1. A hollow tubular frame member of a bicycle, said frame member having opposed aligned apertures therethrough of a diameter substantially less than the thickness of the frame member, an elongated bearing sleeve that extends transversely through said frame member apertures and projects from opposing sides thereof, a pair of wedging elements disposed around said sleeve and extending inwardly of said frame member into respective ones of said apertures, means forming an abutment on said sleeve in abutment with one of said wedging elements, a screw thread on said sleeve, and a cooperatively threaded member received by said screw thread for applying pressure to the other of said wedging elements, whereby tightening of said cooperatively threaded member on said screw thread urges said wedging elements into said respective apertures to secure said bearing sleeve in said tubular frame member, the frame member and sleeve being perpendicular to each other at the point of juncture between them.

4,191,489

METHOD FOR IMPROVING LOAD TRANSFERS BETWEEN CONCRETE SLABS IN ZONES AT WHICH JOINTS ARE PROVIDED, AND MEANS FOR PERFORMING SAME

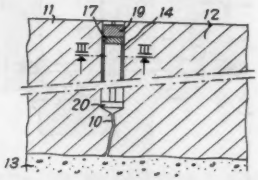
Michel Ray, Paris, and Jean L. Nissoux, La Chevroliere, both of France, assignors to Etat Francais Represente par le Ministere de l'Environment et du Cadre de Vie Laboratorie Central des Ponts et Chaussees, Paris, France

Filed Nov. 1, 1978, Ser. No. 956,665

Claims priority, application France, Nov. 7, 1977, 77 33423

Int. Cl.² E01C 11/18

U.S. Cl. 404—51 **15 Claims**



1. Load transfer means for a joint between two adjacent slabs in a concrete pavement having an upper surface, said means comprising at least one elongated, substantially cylindrical connection piece having an axis and adapted to be easily deformed over its entire length by transverse deformation in at least one direction of deformation substantially perpendicular to its axis, said piece being disposed so that its axis extends substantially vertically and in the plane of the joint between said two slabs, the said direction of deformation being arranged substantially perpendicular to the plane of the joint, said piece being in contact with both of said slabs with the contacting portions being on opposite sides of the axis of the connection piece and being adhered to the respective slabs so as to prevent any relative movement between said contacting portions and the respective slabs, whereby vertical solicitation is transmitted from one slab to the other through said connection piece without impairing free horizontal expansion or contraction of said slabs.

4,191,490

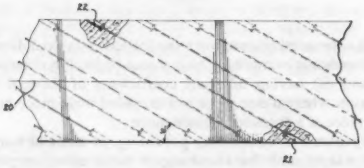
PRESTRESSED CONCRETE ROADWAY

George D. Barnett, Palm Desert, Calif., assignor to Barnett, Haynes & Barnett, International, Palm Desert, Calif.

Continuation-in-part of Ser. No. 814,993, Jul. 12, 1977, abandoned. This application Aug. 25, 1978, Ser. No. 936,814

Int. Cl.² E01C 5/08

U.S. Cl. 404—70 **8 Claims**



1. A section of prestressed concrete roadway comprising:

a. a poured-in-place concrete slab section having predetermined thickness, width, and length and having a longitudinal axis, said poured-in-place concrete slab section having first and second opposed edges;

b. a plurality of post-tensioned diagonal strands distributed at predetermined intervals in said concrete slab section, each of said post-tensioned diagonal strands being substantially parallel to all of the others of said post-tensioned

diagonal strands, each of said post-tensioned diagonal strands being oriented at a predetermined angle with respect to said longitudinal axis, each of said post-tensioned diagonal strands having first and second ends, respectively, said first end of each of said post-tensioned diagonal strands being anchored into said poured-in-place concrete slab section along said first edge, said second end of each of said post-tensioned diagonal strands being anchored into said poured-in-place concrete slab section along said second edge, said poured-in-place concrete slab section containing no post-tensioned diagonal strands which are not parallel to each of said plurality of post-tensioned diagonal strands;

c. first anchoring means attached to each of said first ends for anchoring said first ends into said first edge of said poured-in-place concrete slab section; and

d. second anchoring means attached to each of said second ends for anchoring said second ends into said second edge of said poured-in-place concrete slab section, said first and second anchoring means maintaining predetermined effective tensile forces in each of said diagonal strands, said predetermined effective tensile forces acting to produce a longitudinal compressive force in said poured-in-place concrete slab section, said predetermined effective tensile forces also acting to produce a shear force in said poured-in-place concrete slab section, said predetermined angle being selected such that said longitudinal compressive force exceeds a predetermined magnitude and said shear stress is sufficiently low to avoid significant weakening of said poured-in-place slab section;

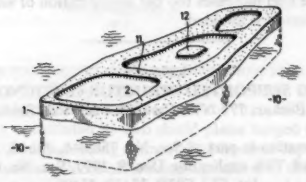
whereby, all of said first ends of said post-tensioned diagonal strands are oriented in the same direction along said first edge surface to permit rapid post-tensioning of said post-tensioned diagonal strands without interference from others of said post-tensioned diagonal strands and without requiring reorienting of equipment utilized to perform said post-tensioning of said diagonal strands.

4,191,491

CREATING AND MAINTAINING A POOL OF FRESH WATER ON A TABULAR ICEBERG

Georges L. Mougin, Paris, France, assignor to ITI Limited, Paris, France

Filed Mar. 8, 1978, Ser. No. 884,406
Claims priority, application France, Mar. 15, 1977, 77 07596
Int. Cl.[2] E02B *1/00*
U.S. Cl. 405—52 **10 Claims**



5. A method of creating and maintaining a pool of water on an iceberg, comprising the steps of:

(a) providing an iceberg having a substantially horizontal upper surface; and

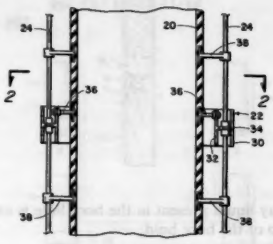
(b) applying an insulating film along a closed path on said horizontal upper surface to permit solar radiation to form said pool by the melting of said iceberg within said closed path, with said film extending down the inside wall of said pool, the further melting of said iceberg being limited after said pool is formed because the heat of vaporization of the water of said pool is greater than the heat of fusion of ice in said iceberg.

4,191,492

METHOD OF INSTALLING A LINER IN A LARGE DIAMETER BOREHOLE

James H. Cobbs, 5144 S. New Haven, Tulsa, Okla. 74135

Division of Ser. No. 838,745, Oct. 3, 1977. This application Sep. 29, 1978, Ser. No. 947,011
Int. Cl.[2] E21D *11/04, 5/00, 9/00*
U.S. Cl. 405—133 **3 Claims**



1. With a liner of low flexural rigidity adapted to be grouted into a borehole in the earth, said liner comprising a cylinder having a plurality of spaced outwardly extending keys attached at their first ends to said cylinder and extending outwardly, with their outer ends having suitable means to lock to the grout,

the method of installation into a mud filled borehole comprising the steps of:

(a) installing at least one support ring around said cylinder at a selected position, concentric with said cylinder and attached to said cylinder by a plurality of circumferentially spaced keys;

(b) inserting said liner, axially, into said borehole, with its bottom end at a selected distance above the bottom of said borehole;

(c) inserting a plurality of grout pipes circumferentially spaced into the annulus between said cylinder and the wall of said borehole to a point near the bottom of said borehole;

(d) pumping in grout through said pipes into said annulus, while

(e) raising said pipes, as the level of the grout in said annulus rises, always keeping the bottom ends of said pipes below the surface of said grout.

4,191,493

METHOD FOR THE PRODUCTION OF A CAVITY LIMITED BY A FLEXIBLE MATERIAL

Knut Hansson, Malmö, and Lars Larson, Falsterbo, both of Sweden, assignors to Aktiebolaget Platmanufaktur, Malmo, Sweden

Filed Jul. 14, 1977, Ser. No. 815,840
Int. Cl.[2] E21D *11/00*
U.S. Cl. 405—150 **8 Claims**

1. A method for lining a vertical bore hole in the ground with a tubular length of material and for removing any liquid present in the bore hole, said method comprising providing a magazine having a substantial length of tubular material radially wound on itself in a number of overlapping layers, pulling one end of tubular material from the magazine, closing said end to form a tubular cavity within the portion of the tubular material pulled from the magazine, inserting the magazine into the bore hole to the bottom thereof, supplying a pressure medium to said tubular cavity to unwind said material from the magazine while propelling the magazine upwardly through said bore hole, said material which is being unwound being

pressurized by said pressure medium to fit tightly against the wall of the bore hole such that as the magazine advances

upwardly any liquid present in the bore hole is expelled from the open top of the bore hold.

4,191,494

APPARATUS OF EFFECTING BUOYANCY ON SUBMERGED ARTICLES

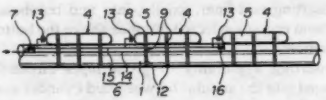
Koji Nakamura, Chigasaki; Masaru Ogata, Yokohama, and Takuzo Nakatsuka, Hyogo, all of Japan, assignors to Shibata Kogyo Co., Ltd, Akashi and Nippon Kokan Kabushiki Kaisha, Tokyo, both of, Japan

Filed Apr. 21, 1978, Ser. No. 898,768

Claims priority, application Japan, Apr. 28, 1977, 52-49462

Int. Cl.[2] F16L *1/00, 3/00*

U.S. Cl. 405—171 **8 Claims**



1. An apparatus for imparting buoyancy to articles in water, comprising a plurality of submergible floats of bag shape and of soft air-tight material, attaching means disposed on the outer portion of said floats for attaching said floats to said article, pipe means for supplying pressurized air into said floats, and differential pressure regulating valve means disposed between said pipe means and said floats, whereby said valve means controls the amount of air supplied to said floats in accordance with the difference in pressure between the inside of said flaots and the outside thereof with added air being supplied when said difference is lower than a predetermined value and with air being exhausted from said floats when said difference is higher than said predetermined value, wherein said differential pressure regulating valve means comprise inlet port connectable to said pipe means and an outlet port connectable to said float, spring room disposed between said input and output ports and having a valve disc and a valve seat room, a room formed above said valve seat room via a partition in which a diaphragm is furnished to divide into a diaphragm room and a spring room which has windows communicating with the outside, and wherein said partition is formed with a hole to provide communication between said diaphragm room and said valve seat room, said valve disc being formed with a valve stem protruding into said diaphragm room through said partition, said diaphgram having a hole to provide communication between said diaphragm room and said pring room which is equipped with a spring, whereby said diaphragm is pushed toward said diaphragm room so that said communicating hole is closed by means of said valve stem, wherein said spring balances said diaphragm when the pressure of said diaphragm room reaches a predetermined value exceeding the pressure of said spring room.

4,191,495

SEA PLATFORMS TO SUPPORT INDUSTRIAL INSTALLATIONS

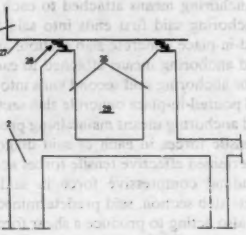
Jose U. Rivacoba, and Alberto T. Galdos, both of Bilbao, Spain, assignors to Sener, Ingenieria y Sistemas S.A., Madrid, Spain

Filed Nov. 3, 1978, Ser. No. 957,342

Claims priority, application Spain, Nov. 3, 1977, 463,817

Int. Cl.[2] E02B *17/02*

U.S. Cl. 405—195 **11 Claims**



1. A marine platform to support industrial installations which comprises:

a barge;

a lower keel on which said barge rests and which keel is positioned on the ocean floor;

intermediate friction means, situated between contact surfaces of the barge and keel;

elastic means, interconnected to the barge and keel, for opposing displacements between said barge and keel;

wherein said displacements are controlled because the friction resulting from the intermediate friction means impedes movements between said barge and keel caused by external forces acting on the barge, such as waves, currents, and winds, and caused by effects of acceleration on the keel induced by earthquake of small magnitude;

said intermediate friction means having means for permitting displacements between said barge and keel in the case of an earthquake of great magnitude;

said elastic means having means for decreasing the elasticity constant in discrete degrees when the displacements surpass a predetermined value so that, as the intensity of the earthquake increases, the oscillation period of the barge on the keel increases too but amplification of said oscillation period is avoided.

4,191,496

GAS-BAG SUPPORTED STRUCTURAL FOUNDATION

Robert F. Becker, 777 NW. Carkeek Park Rd., Seattle, Wash. 98177

Continuation-in-part of Ser. No. 756,844, Jan. 5, 1977, abandoned. This application Dec. 9, 1977, Ser. No. 859,172

Int. Cl.[2] E02D *27/32, 35/00*

U.S. Cl. 405—229 **8 Claims**

1. In combination with a building constructed on terrain subject to shifting due to thawing and freezing, a foundation for supporting the building comprising

(a) a plurality of inflatable bag members each including at least one gas opening, said bag members being adapted for positioning on the terrain;

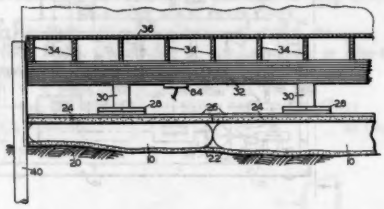
(b) support means mounted on the upper surface of said bag members; and

(c) self-leveling means for maintaining said support means in a substantially horizontal position, said self-leveling means including

(1) compressed gas supply means;

(2) supply and exhaust conduit means connecting each of said bags with said gas supply means and with exhaust, respectively;

(3) first valve means (76) connected in said supply conduit means and second valve means (82) connected in said exhaust conduit means, said valve means controlling the degree of inflation of said bags, respectively; and



(4) level-responsive means responsive to shifting of said support means resulting from thawing or freezing of the terrain, said level-responsive means being mounted on said support means for selectively operating said valve means to maintain said support means in a level condition.

4,191,497

MINE ROOF SUPPORTS

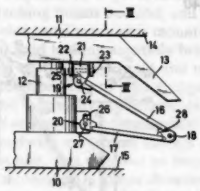
Helmut Poklekowski, Lunen; Klaus Seeberger, Werne, and Gunther Harmsma, Bergkamen-Oberberge, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Jul. 3, 1978, Ser. No. 921,231

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1977, 2730295

Int. Cl.² E21D *15/44*

U.S. Cl. 405—296 **13 Claims**



1. A mine roof support unit comprising a floor sill, a roof cap supported on the floor sill by hydraulic prop means, and a goaf shield fitted between the roof cap and the floor still, the goaf shield being constituted by two shield plates hinged together, the upper shield plate being connected to the roof cap by a first link, and the lower shield plate being connected to the floor sill by a second link, the first link incorporating lost motion whereby the roof cap can be lowered sufficiently to permit the advance of the unit without the hinge connection between the two shield parts moving towards the goaf side of the working, wherein the first link comprises a first link member connected to the roof cap, and a second link member connected to the upper shield plate, the second link member being slidable relative to the first link member, and wherein the roof cap is provided with an integral, downwardly depending, inclined deflector plate, the first link member being fastened to the underneath surface of said deflector plate, the second link member being slidable relative to the first link member in a direction parallel to the underneath surface of said deflector plate.

4,191,498

HYDRAULIC ROOF SUPPORT CONTROL SYSTEM

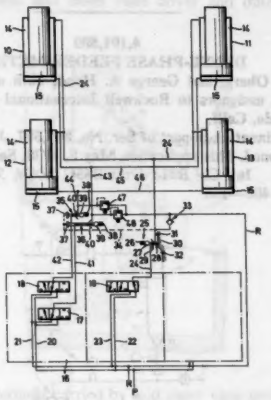
Walter Weirich, Dortmund, and Harry Rosenberg, Lüdinghausen, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed May 24, 1978, Ser. No. 909,087

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1977, 2733270

Int. Cl.² E21D *15/44*

U.S. Cl. 405—302 **19 Claims**



1. In a hydraulic control system for a roof support unit of an underground mining installation, the roof support unit including a roof cap supported by hydraulic prop means capable of controlled movement over a fixed range between extended and retracted positions, and the control system including a valve for controlling the supply of pressurised hydraulic fluid from a source to the prop means, the improvement comprising: an actuator for closing said valve to terminate the supply of pressurised hydraulic fluid to the prop means as soon as the prop means has been retracted by a predetermined amount less than said fixed range.

4,191,499

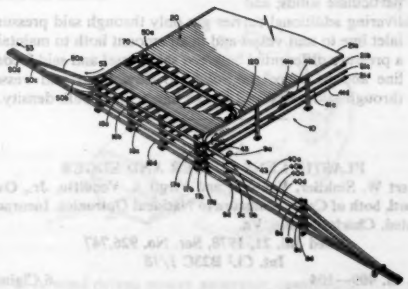
LIVE STORAGE SYSTEM

Rudolph E. Futer, Alameda, Calif., assignor to Futerized Systems, Inc., Hayward, Calif.

Filed Jul. 25, 1978, Ser. No. 926,621

Int. Cl.² B65G *51/02*

U.S. Cl. 406—34 **10 Claims**



1. In a live storage system for packages wherein a plurality of storage rows is arranged to support said packages and each

storage row has a slot along its base, the improvement comprising:

a traveler mounted beneath said storage rows and movable to positions beneath each of said rows, said traveler having an air plenum and a plurality of air jets along the upper surface of said plenum, and

air supply means for pressurizing the plenum of said traveler, whereby the pressurized air flows through said air jets of said traveler and through said slot of one of said storage rows to create an air film along which said packages are conveyed.

4,191,500

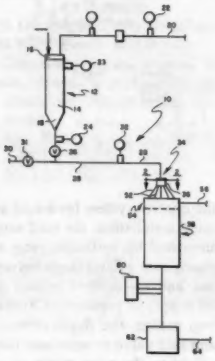
DENSE-PHASE FEEDER METHOD

Carl L. Oberg, and George A. Hood, both of Canoga Park, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 819,307, Jul. 27, 1977, abandoned. This application May 8, 1978, Ser. No. 903,434

Int. Cl.[2] B01J *1/00;* **B65G** *53/04, 53/40*

U.S. Cl. 406—146 **7 Claims**



1. The method of transporting particulate solids in dense-phase flow comprising the steps of:

filling a feeder vessel with particulate solids;

sealing said feeder vessel;

delivering carrier gas into said sealed feeder vessel through a pressure inlet line in an amount to provide an initial pressure in excess of that in a downstream feeder line;

opening a valve connecting a lower portion of the feeder vessel to said downstream feeder line so as to discharge said solids at their bulk density by the pressure differential and resultant expansion of the gas in the interstices of said particulate solids; and

delivering additional carrier gas only through said pressure inlet line to said vessel and in an amount both to maintain a pressure differential between said vessel and said feeder line and to cause the solids to flow from said vessel through said valve and feeder line at their bulk density.

4,191,501

PLASTIC LENS CUTTER AND EDGER

Robert W. Sinklier, Ventura, and Virgil A. Venditto, Jr., Oxnard, both of Calif., assignors to National Optronics, Incorporated, Charlottesville, Va.

Filed Jul. 21, 1978, Ser. No. 926,747

Int. Cl.[2] B23C *1/18*

U.S. Cl. 409—104 **6 Claims**

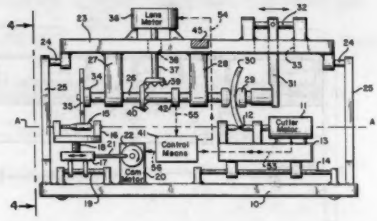
1. A machine for cutting and edging a plastic lens including, in combination:

(a) a table carrying a lens cutter and lens pattern engaging cam in coaxial alignment;

(b) a head carrying a plastic lens to be cut and a lens pattern in coaxial alignment;

(c) means coupling said head to said table for movement towards and away from the axis of said lens cutter and lens pattern engaging cam so that said lens cutter engages the periphery of said lens to be cut;

(d) a head lowering cam means on said table for receiving said head when said cutter engages the periphery of said



lens and gradually lowering said head a given distance to effect a slight radial cut into said periphery, said pattern defining the finished contour of said lens and engaging said cam after said slight radial cut is made into said periphery; and

(e) means for effecting a rotation of said lens and pattern simultaneously, resulting in a cutting of said lens out of the lens material by said lens cutter as opposed to grinding away the periphery of said lens.

4,191,502

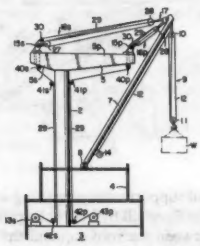
CARGO-HANDLING MACHINE WITH 300-DEGREE OPERATIONAL AZIMUTH RANGE FOR SHIPBOARD USE

Tadaomi Komatsu, Akashi, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Aug. 22, 1978, Ser. No. 935,865

Int. Cl.[2] B63B *27/04*

U.S. Cl. 414—140 **8 Claims**



1. A cargo-handling machine for shipboard use comprising: a derrick post fixedly and uprightly mounted on a structural part of a ship between two loading areas forward and aft of the post; an outrigger fixed to the top of the derrick post and having two arms extending laterally outward from the post; a derrick boom pivotally supported at its inner end by a goose-neck connection positioned substantially below the middle point of the outrigger equidistant from the two outer ends thereof and permitting topping movement of the boom and azimuthal turning thereof continuously through at least 150 degrees of angle clockwise and counterclockwise from a dead-abeam position relative to the outrigger; a cargo-hoisting tackle suspended at its upper end from the top end of the boom; a hoisting winch for operating the cargo-hoisting tackle; two boom-topping tackles connected at their inner ends to respective swivel pulleys pivotally secured respectively to the two

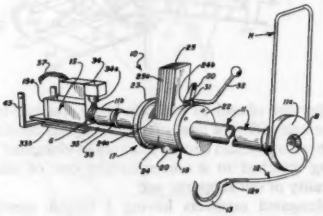
outer ends of the outrigger; topping winches for respectively operating the topping tackles; and a multiple-swivel universal coupling connected between the top end of the boom and the outer ends of the two topping tackles and functioning to permit the two topping tackles to undergo inversion of their positions relative to the boom without mutual contacting or entwinement when the boom turns azimuthally through said dead-abeam position from one loading area to the other.

4,191,503

DEVICE FOR RELEASABLY SECURING ONE UNIT AGAINST A SECOND UNIT

Robert O. Neff, Milwaukee; Arthur K. White, Mequon, and Norbert Hahn, Cudahy, all of Wis., assignors to Rite-Hite Corporation, Brown Deer, Wis.

Filed Feb. 1, 1978, Ser. No. 874,119
Int. Cl.² B65G *67/02*; B60D *7/00*; G08B *21/00*
U.S. Cl. 414—401 **10 Claims**



1. A device for use in releasably securing one unit against a second unit, said device comprising an elongated member; first means adjustably carried on an end of said elongated member remote from the one unit; an attaching means carried by said member and having one end thereof extending from a second end of said elongated member nearest the one unit and being adapted to be releasably connected to the one unit, said attaching means having a second end engaging said first means, the latter being adjustable in one direction relative to said elongated member in response to a predetermined pulling force exerted on said attaching means one end; and a locking assembly on which said elongated member is mounted for controlled endwise movement, said locking assembly being adapted to be adjustably mounted on the second unit and including friction means movable independently of said elongated member between operative and inoperative positions, said friction means, when in an operative position, engaging said elongated member and allowing endwise movement thereof only in direction away from the first unit, and, when in an inoperative position, allowing endwise movement in either direction, second means engaging said friction means and biasing said friction means into said operative position, and manually actuated means adjustable independently of said elongated member for moving said friction means from an operative position to an inoperative position.

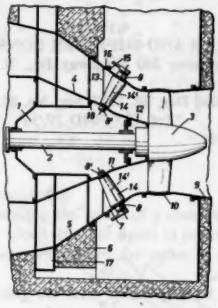
4,191,504

DUCT-MOUNTED TURBINE AND METHOD OF INSTALLING THE SAME

Leopold Haslinger, Linz, and Josef Krenn, Traun, both of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Vienna, Austria

Filed Oct. 25, 1977, Ser. No. 844,639
Claims priority, application Austria, Nov. 2, 1976, 8109/76
Int. Cl.² F01B *25/02*
U.S. Cl. 415—1 **3 Claims**

1. A duct-mounted turbine, which comprises
a rotatably mounted runner,
an annular inner vane cover which is axially spaced from said runner and has first and second flanges,
an annular water guide disposed between said runner and said inner vane cover and having a third flange which is joined to said first flange,
an inner tubular housing having a fourth flange which is joined to said second flange,
an annular runner cover which surrounds said runner and has a fifth flange,
an annular outer vane cover which surrounds said inner vane cover and is radially spaced therefrom and has a sixth flange joined to said fifth flange,
an outer tubular housing which surrounds said inner tubular housing and is radially spaced therefrom a welded interface between said outer vane cover and outer tubular housing,



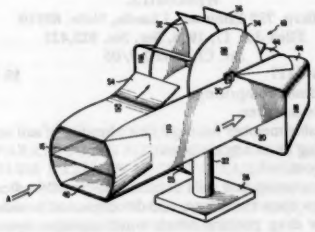
outer vane mounts carried by said outer vane cover,
inner vane mounts carried by said inner vane cover and a plurality of vanes, each of which is mounted for rotation on its own axis in one of said outer vane mounts and one of said inner vane mounts,
said flanges lying in parallel planes,
each of said outer vane mounts being adapted to be released for a movement in a direction which is normal to the axis of the associated vane when said inner and outer tubular housings and said inner and outer vane covers have been installed on the site and said inner and outer vane covers have been joined at said flanges.

4,191,505

WIND WHEEL ELECTRIC POWER GENERATOR

John W. Kaufman, Madison, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 24, 1978, Ser. No. 880,726
Int. Cl.² F03D *3/04*
U.S. Cl. 415—2 **13 Claims**



1. A wind driven power generator, comprising:
wheel means adapted to be operatively connected to electric power generator means; and
means defining a plurality of air flows for simultaneously

impinging upon different portions of said wheel means for cumulatively effecting rotation of said wheel means and the operation of said electric power generator means for the generation of electric power,

said air flow means comprising a first primary air duct means for directing a first air flow onto a first portion of said wheel means; and

auxiliary air duct means for directing a second air flow onto a second portion of said wheel means, said auxiliary duct means comprising a pair of ducts disposed upon opposite sides of said wheel means, and

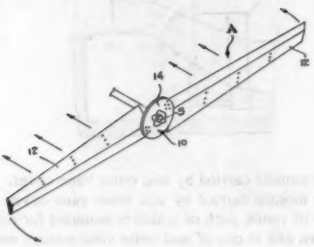
manifold means for receiving the air flows conducted through said pair of ducts and for merging said flows into said second air flow.

4,191,506

PROPELLER AND IMPELLER CONSTRUCTIONS

Lester M. Packham, 240 Kingsway Dr., N. Mankato, Minn. 56001

Filed Dec. 20, 1977, Ser. No. 862,367
Int. Cl.[2] F04D *29/38*
U.S. Cl. 416—91 **33 Claims**



1. An improved propeller or impeller blade which is formed by a first relatively flat longitudinally extending plate, and a structural member bent to form second and third integrally connected relatively flat and longitudinally extending plates angulated with respect to each other, the second and third longitudinally extending plates being secured to said first plate thereby providing a substantially triangular blade in cross section and which said three plates form a substantially hollow interior chamber in said blade, one of said second or third plates functioning as a leading plate and the other of said second or third plates functioning as a trailing plate in the blade, and said first plate functioning as a ram side of said blade and serving as a pressure plate, said blade having a hub end and a tip end and said plates forming an opening at said tip end communicating with said hollow interior chamber.

4,191,507

WINDMILL

Gary J. DeBerg, 735 Elmwood, Lincoln, Nebr. 68510

Filed Jul. 17, 1978, Ser. No. 925,423
Int. Cl.[2] F03D *3/06*
U.S. Cl. 416—117 **10 Claims**

1. A windmill comprising:

a rotatable member;

said rotatable member having a first plurality of sail supports extending at an angle thereto;

a plurality of sails;

means for causing said sails to billow outwardly when wind impinges upon them from one direction and to move to a flat low drag position when wind impinges upon them from another direction;

said sails being flexible;

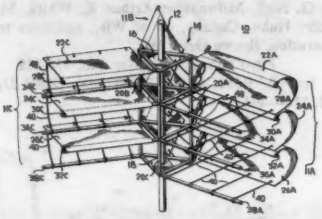
said means for causing said sails to billow outwardly including a second plurality of sail supports;

each of said second plurality of said supports corresponding to a different one of said first plurality of sail supports and extending parallel thereto;

each of said second plurality of sail supports being spaced from its corresponding first sail support by a first distance in the direction of said rotatable member and in a second direction orthogonal to said corresponding first sail support;

each of said sails being attached to a different one of said first plurality of sail supports with one edge of said sail being in close proximity to said sail support;

a plurality of elongated members;



the other end of each of said sails being attached to one end of certain different ones of said elongated members;

the other ends of said certain plurality of elongated members being attached to a corresponding one of said second plurality of sail supports; and

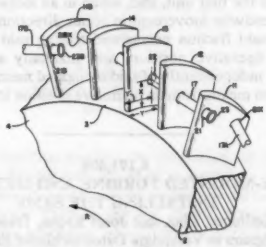
said elongated members having a length approximately equal to said first distance and said second distance, whereby when said sails billow outwardly their lower edges are substantially beneath their upper edges and when said sails are in a flat low drag position said elongated members stretch upwardly from a corresponding one of said sail supports to the trailing edge of said sail.

4,191,508

TURBINE ROTOR CONSTRUCTION

Michio Kuroda; Yoshiaki Yamazaki; Kiyoshi Namura; Fumio Kato; Yasuaki Akatsu; Daizo Morimoto, and Satoshi Ninomiya, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan and Hitachi Kizai Kogyo Co. Ltd., Japan

Filed Jan. 31, 1978, Ser. No. 873,773
Claims priority, application Japan, Feb. 2, 1977, 52-978277
Int. Cl.[2] F01D *5/10, 5/24*
U.S. Cl. 416—196 R **6 Claims**



1. A turbomachine rotor arrangement having a rotor wheel and blades thereon with tie means for interconnecting adjacent blades, the arrangement comprising:

at least three adjacent blades respectively defining tie holes, wherein adjacent blades define tie holes in which the distances between centers of respective ones of said holes and the circumferential surface of the rotor wheel are different, and wherein said tie holes are disposed such that

the distances between respective centers of the holes and the leading edge of the associated respective blades are also different, and

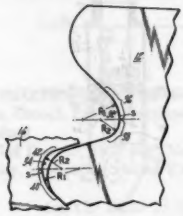
tie means for interconnecting said blades, disposed in said tie holes with frictional engagement during rotation of said rotor so as to be acted upon by different amplitudes of vibration at respective ones of said adjacent blades during rotation.

4,191,509

ROTOR BLADE ATTACHMENT

Salvatore A. Leonardi, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 27, 1977, Ser. No. 864,948
Int. Cl.² F01D 5/30
U.S. Cl. 416—219 R **3 Claims**



1. A rotor blade of the type having a root section including a plurality of grooves in the root section for engagement with a blade restraining member, wherein the improvement comprises:

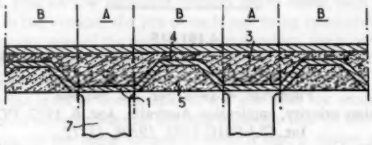
a root section having grooves formed to a first radius of curvature in a lower region of each groove and formed to a second radius of curvature in an upper region of each groove, the first radius of curvature being larger than the second radius of curvature.

4,191,510

AXIAL FLOW COMPRESSOR ROTOR DRUM

Pierre M. Teysseyre, Villejuif, and Claude P. Baudier, Orsay, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation (S.N.E.C.M.A.), Paris, France

Filed Aug. 31, 1977, Ser. No. 829,214
Claims priority, application France, Apr. 28, 1977, 77 13475
Int. Cl.² F01D 5/06
U.S. Cl. 416—230 **8 Claims**



1. A drum for a compressor rotor having recess means for mounting rotor blades which comprises:

an internal layer of material;

an external layer of material;

a core layer of material sandwiched between said internal and external layers of material, said external layer of material being formed with peripheral ridges and grooves; and

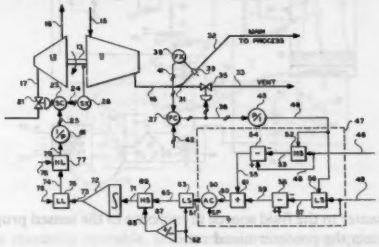
tensile reinforcing rings positioned within said grooves of said external layer of material.

4,191,511

COMPRESSOR CONTROL

William S. Stewart, and James W. Hobbs, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 26, 1976, Ser. No. 708,965
Int. Cl.² F04B 49/00
U.S. Cl. 417—18 **16 Claims**



1. Apparatus comprising:

means for controlling the speed of a compressor means in response to a speed set point signal to provide a compressor speed corresponding to the value of said speed set point signal;

means for dividing the flow of compressed gas from said compressor means into a main stream within a main conduit means and a vent stream within a vent conduit means;

means for automatically controlling the flow of gas through said main conduit means by varying the resistance to flow of a flow restriction means associated with said vent conduit means;

means for sensing the position of said flow restriction means and for producing a restriction signal representative thereof;

means for generating a compressor acceleration signal in response to said restriction signal being representative of a position of said flow restriction means outside a preselected position range; and

means for generating said compressor speed set point signal in response to said compressor acceleration signal.

4,191,512

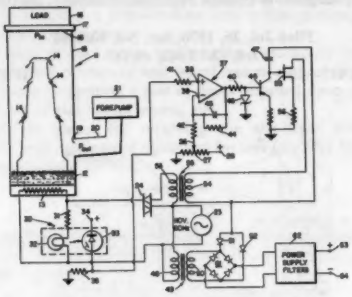
APPARATUS AND METHOD FOR CONTROLLING PRESSURE RATIO IN HIGH VACUUM VAPOR PUMPS

Charles D. O'Neal, III, Bolton; Leo J. Blumle, Sudbury, and Marsbed Hablanian, Wellesley, all of Mass., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Aug. 29, 1977, Ser. No. 828,835
Int. Cl.² F04F 9/08
U.S. Cl. 417—54 **16 Claims**

11. A method of maintaining a predetermined pressure ratio between an inlet port and an outlet port of a vacuum vapor pump having a source of fluid that is vaporized by a heater

comprising sensing a property of the pump indicative of the pressure ratio, and controlling power continuously supplied by



the heater to the fluid source in response to the sensed property to attain the predetermined ratio.

4,191,513

PUMP FOR CONVEYING CEMENT

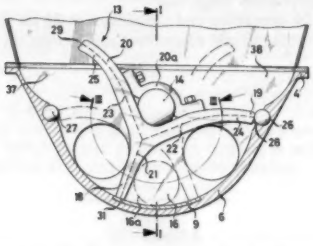
Friedrich Schwing, Herne, Fed. Rep. of Germany, assignor to Friedrich Wilhelm Schwing GmbH, Herne, Fed. Rep. of Germany

Filed Apr. 14, 1978, Ser. No. 896,602

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1977, 2716954

Int. Cl.² F04B *15/02*

U.S. Cl. 417—517 **4 Claims**



1. A reciprocating piston pump for conveying cement comprising two pump cylinders; an input container; a multi-limb oscillating shutter valve mounted on a horizontal shaft and arranged in front of the pump cylinders and below the input container; a housing for the oscillating shutter valve, said housing having an end wall, at least two ports and a suction connection in the housing leading from the input container, said at least two ports in the housing connected to the pump cylinders respectively; an outlet located in the end wall of the housing; and two inlet ports in the housing for placing said suction connection in communication with said ports connected to the pump cylinders respectively; said oscillating shutter being movable between two positions and including two inlet control limbs each controlling a different one of said inlet ports and an outlet control limb the forward edge of which passes over and controls said outlet.

4,191,514

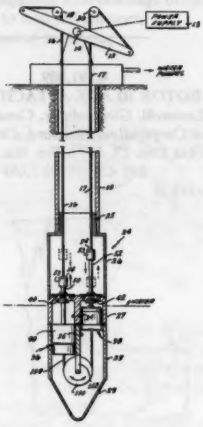
PUMPING ARRANGEMENTS TO CONSERVE ENERGY

Richard H. Ely, 6609 Gazette Ave., Canoga Park, Calif. 91306, and Larry E. Haynes, 22350 Paraguay, Saugus, Calif. 91350

Filed Jun. 13, 1977, Ser. No. 806,189

Int. Cl.² F04B *21/04, 39/10, 43/02*

U.S. Cl. 417—529 **2 Claims**



1. In a pumping system, in combination, a pump cylinder having a cylinder bore, a piston reciprocatable in the bore, the cylinder being in a well bore, pipe means providing communication to the surface, and flexible cable means for producing reciprocation of the piston in the bore, pulley means over which the cable means passes and means for imparting reciprocatory movement to the cable means, said last means including a walking beam, opposite ends of said beam being connected to the cable means, a second similar cylinder bore having a second piston in it, the cable means including a section connecting between the pistons whereby the pistons move in opposite directions, both said cylinder bores and said pulley means being within the pipe means, said cylinders having pistons which reciprocate oppositely to each other and a second pair of dual cylinders and pistons which reciprocate oppositely to each other, means connecting pistons whereby two of the pistons move together in each direction, first vertically aligned bores in which pistons which move together respectively operate, and second vertically aligned bores in which the other pair of pistons which move together respectively move, the said respective first bores and second bores being laterally spaced from each other, the said first bores and said second bores being offset from each other by an amount that is less than the diameter of the pistons.

4,191,515

SEALING SYSTEM FOR A ROTARY MACHINE

John P. Ettridge, 235 Diagonal Rd., Warradale, Australia (5046)

Filed Apr. 4, 1978, Ser. No. 893,344

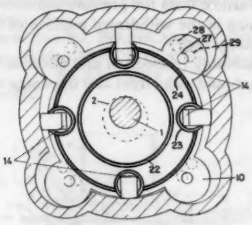
Claims priority, application Australia, Apr. 6, 1977, PC9688

Int. Cl.² F01C *1/02, 19/08, 21/12*

U.S. Cl. 418—61 R **2 Claims**

1. A rotary machine comprising a hollow casing, a rotor freely mounted on an eccentric shaft within the cavity, spaced lobes fixed in relation to the rotor and cooperating in recesses in the casing, with the recesses and lobes constraining the rotor to partake of orbital movement without rotation during rotation of the shaft, a plurality of vanes mounted in slots in the rotor to engage the interior of the casing to form working chambers therebetween, and sealing means between the end faces of the rotor and the respective end walls of the casing to seal therebetween to prevent escape of working fluid therebe-

tween and from around the vane slots, characterized in that the lobes form sliding valves for admitting and exhausting fluid to



the working chamber, the lobes having an aperture therethrough to cooperate with spaced apertures forming inlet and outlet ports in an end wall of the casing.

4,191,516

ATOMIZER FOR MAKING POWDER

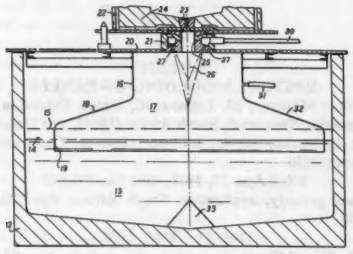
Richard J. Dain, Crouch, England, assignor to Powdrex Limited, London, England

Filed Dec. 23, 1977, Ser. No. 863,645

Claims priority, application United Kingdom, Dec. 23, 1976, 53878/76

Int. Cl.[2] B22D *23/08*

U.S. Cl. 425—7 **13 Claims**



1. An atomizer for making powder comprising a vessel defining an atomizing chamber located above a water bath, the vessel having a lower part which widens out to be of inverted dished shape and a lower edge which extends into the water bath, means for establishing a falling stream of molten metal through the chamber towards the water bath, nozzle means arranged to supply first and second pairs of downwardly directed, long narrow sectioned primary jets of water, each at an angle to the vertical, the jets of each pair being symmetrically on opposite sides of the path of the metal stream, the nozzles of the pairs being on lines at right angles to one another, and arranged so that the jets of the first pair intersect at a level above the level of intersection of the jets from the second of the pairs, such that in use the jets from the first of the pairs impinge on the metal stream to form it into a ribbon shape substantially in a plane containing the second pair of nozzles and the jets from the second pair impinge on the ribbon to complete atomization into discrete particles of molten metal, the jets then impinging on the water bath and inducing a secondary circulation of quench water in the water bath, up the walls of said lower part and within said lower part of the atomizing chamber, the volume of the secondary circulation being greater than the volume of the primary jet flow and acting to quench the particles into powder.

4,191,517

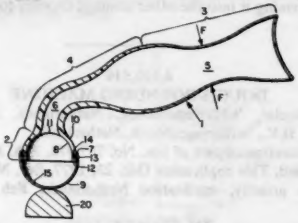
METHOD AND APPARATUS FOR IMPARTING A PREDETERMINED SHAPE TO PRODUCT OF DOUGH-LIKE CONSISTENCY

Alan E. Byrd, Hamilton; John S. Amneus, Cincinnati; Malcolm B. Lucas, Cincinnati; Robert H. Van Coney, Cincinnati, and James E. Van Loan, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 24, 1978, Ser. No. 909,141

Int. Cl.[2] B28B *7/12*

U.S. Cl. 425—286 **4 Claims**



1. A manually operable, self-contained dispensing apparatus for imparting a predetermined shape to discrete units of product of dough-like consistency dispensed therefrom, said apparatus comprising a rigid bowl embodying said predetermined shape, a resiliently deformable diaphragm substantially conforming to and disposed within said bowl releasably secured in sealed relation thereto about its periphery, a substantially rigid neck portion integrally formed with and secured to the exterior of said rigid bowl and an elongated, resiliently deformable handle portion integrally formed with and secured to said substantially rigid neck portion, said resiliently deformable handle portion comprising a resiliently deformable fluid-containing chamber having a wall of lesser thickness than said neck portion in fluid communication with the area intermediate said rigid bowl and the unsecured portion of said resiliently deformable diaphragm through said neck portion, said chamber containing a volume of said fluid sufficient to substantially invert the unsecured portion of said diaphragm from said bowl when said resiliently deformable handle is squeezed, thereby discharging said product without substantially altering its shape and without need for manual intervention to remove said product from said apparatus.

4,191,518

EQUIPMENT FOR PRODUCING SPECIAL PIPES

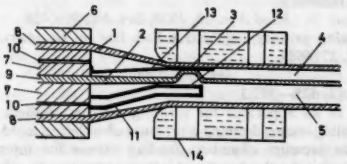
Susumu Kojimoto, Takatsuki; Takami Sato, Toyonaka, and Toshio Mori, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 723,977, Sep. 16, 1976, Pat. No. 4,113,814. This application May 8, 1978, Ser. No. 903,799

Claims priority, application Japan, Sep. 22, 1975, 50/114969; Sep. 22, 1975, 50/114970

Int. Cl.[2] B29D *23/04*

U.S. Cl. 425—326.1 **3 Claims**



1. Equipment for producing a special pipe, said pipe having a thermoplastic resin tubular body longitudinally partitioned by a diaphragm into two conduits and a plurality of barriers to one of the conduits forming projections extending from said

diaphragm into said one conduit and spaced along the length of the conduit to contact intimately with the inside wall of the conduit, said equipment comprising a die body having:

(a) a circular slit therein for extrusion of said tubular body;

(b) a stationary mandrel having flat slit therein for extrusion of said diaphragm, and

(c) a nozzle projecting downstream from the mandrel so as to extend longitudinally into one conduit of a tubular body extruded from said circular slit and partitioned by a longitudinally extending diaphragm, said nozzle having an opening for expelling a fluid against the diaphragm and deforming it into the other conduit thereby to form barriers.

4,191,519

DOUGH-ROUNDING MACHINE

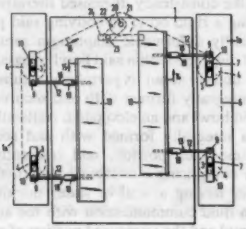
Johan Benier, 's-Hertogenbosch, Netherlands, assignor to Benier B.V., 's-Hertogenbosch, Netherlands

Continuation-in-part of Ser. No. 767,978, Feb. 11, 1977, abandoned. This application Dec. 23, 1977, Ser. No. 863,606

Claims priority, application Netherlands, Feb. 19, 1976, 7601680

Int. Cl.² A21C *1/00*

U.S. Cl. 425—332 **10 Claims**



1. In a dough-rounding machine including a carrying surface, a pair of kneading plates located above the carrying surface and diverging upwardly therefrom to form an open ended trough, and driving means for reciprocating the kneading plates in opposite directions laterally and longitudinally of the trough, the improvement wherein the carrying surface is movable in the longitudinal direction of the trough and wherein there are provided means for moving the carrying surface back and forth under the kneading plates in the longitudinal direction, and wherein there are provided means for synchronizing said carrying surface moving means with said kneading plate driving means so that said moving means causes the carrying surface to advance a piece of dough through the trough from one end thereof to the other.

4,191,520

SEALING ARRANGEMENT FOR A MOLDING APPARATUS

Gunther Kiefer, Schwaigern, Fed. Rep. of Germany, assignor to Adolf Illig Maschinenbau GmbH & Co., Heilbronn, Fed. Rep. of Germany

Filed Apr. 13, 1978, Ser. No. 896,436

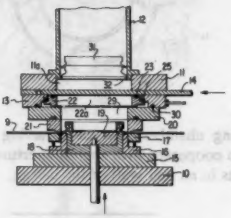
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1977, 2716680

Int. Cl.² B29C *17/04*

U.S. Cl. 425—387.1 **7 Claims**

1. In an apparatus for forming articles of sheet material, including means defining a pressure chamber; a mold arranged in the pressure chamber; feeding means for intermittently advancing the sheet material into the pressure chamber; means defining a discharge opening in the pressure chamber for removing therethrough the articles formed in the mold; a slide movable across the pressure chamber and having an advanced position in which it closes the discharge opening and a withdrawn position in which it opens the discharge opening; pressurizing means for generating a fluid pressure in the pressure chamber in the advanced position of the slide for urging the sheet material into the mold; and discharge means for removing the formed article from the pressure chamber through the discharge opening in the withdrawn position of the slide; the improvement comprising

(a) a piston movably received in said chamber for displacement towards and away from said discharge opening; said



piston having an advanced position and a withdrawn position;

(b) a sealing means carried on an end face of said piston oriented towards said slide; and

(c) means for moving said piston into its said advanced position and for urging said piston with said sealing means into sealing engagement with said slide when said slide is in its advanced position for sealing said pressure chamber with respect to said discharge opening.

4,191,521

BATTERY MOULDING OF PANELS

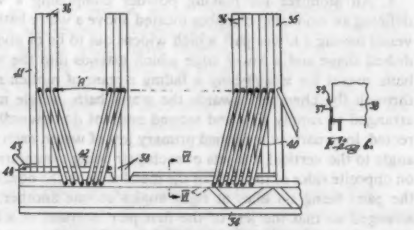
Hendrikus Muldery, 25, Lennox St., Union Extension No. 1, Germiston, Transvaal, South Africa (1401), and Heinz Schubert, 11, Becker St., South Crest, Alberton, Transvaal, South Africa (1450)

Filed Apr. 12, 1978, Ser. No. 895,805

Claims priority, application South Africa, Apr. 22, 1977, 77/2448

Int. Cl.² B28B *7/26*

U.S. Cl. 425—432 **12 Claims**

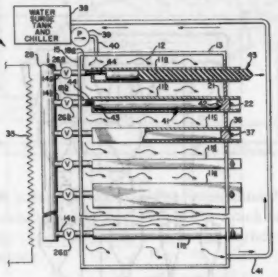


1. A mould assembly comprising at least three mould members, each bounded by a peripheral edge including a top, a bottom and side edges, and each releasably co-operable with each other to define upwardly extending mould cavities between them and inlet apertures at the upper ends of such mould cavities, a supporting frame for the mould members and linkage means pivotally interconnecting each mould member and said frame, said linkage means permitting the entire peripheral edge of a mould member to be moved away from a moulded article and a co-operating mould member to open the mould cavity defined between co-operating mould members.

4,191,522
EXTRUDING MACHINE AND END PRODUCTS

James E. Turner, Southlake, Tex., assignor to Entek Corporation, Southlake, Tex.

Continuation of Ser. No. 799,244, May 23, 1977, abandoned.
This application Nov. 22, 1978, Ser. No. 962,872
Int. Cl.[2] B29H *19/00*
U.S. Cl. 425—552 7 Claims



1. An end product molding apparatus comprising an elongated hollow mold having a predetermined length and internal cross-sectional geometry respectively defining the length and cross-section geometry of a discrete product to be individually molded and subsequently removed from said mold; said mold having a predefined longitudinal axis of symmetry; plug means for selectively closing one end of said mold; said plug means having a mold interior facing end thereof defining a selected mold end geometry; an input supply line having a flow axis parallel to and displaced from the longitudinal axis of symmetry of said mold; said input supply line communicating with a material input port passed through the closed other end of said mold; said supply line and input port having a cross-sectional area substantially less than that of said mold; with substantially the entire cross-sectional area of said input port being displaced from the mold longitudinal axis of symmetry; said supply line being selectively connectable to a pressurized, heat fused flowable material source; enclosure means, means for maintaining the interior of said enclosure means at a chilled ambient temperature; with a predetermined longitudinal expanse of said input supply line being extended within said enclosure means and substantially all of said mold extending within said enclosure means with said one end thereof extended externally of said enclosure means.

4,191,523
PRESS APPARATUS FOR MOLDING SHAPED BODIES FROM FOAMABLE PLASTIC MATERIALS

Jean-Pierre Niederst, Bad Salzuflen, and Karl Holzinger, Bad Oeynhausen, both of Fed. Rep. of Germany, assignors to Herbert Kannegiesser Kommanditgesellschaft, Hollwiessen, Fed. Rep. of Germany

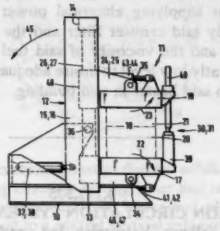
Filed Jun. 16, 1978, Ser. No. 916,384
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1978, 2810789
Int. Cl.[2] B29D *27/00*
U.S. Cl. 425—589 7 Claims

1. An apparatus for molding shaped articles from foamable plastics material such as a foamable polyurethane resin material, including a base support (10), a mold holder (11) mounted to the support for pivotal movement about a first, generally horizontal axis (36), a pair of clamping plates (17, 18) mounted to the mold holder for pivotal movement about respective second and third axes (34, 35) each parallel to the first axis, said plates being disposed opposite each other and one above the other when said mold holder is in a vertical position, a pair of mating mold parts (20, 21) individually mounted to said clamping plates, and means for moving one of said plates toward and away from the other plate, characterized by:

(a) the mold holder comprising a rectangular frame (12) including horizontal top and bottom members (14, 13) and vertical side members (15, 16),

(b) a pair of vertical guide columns (26, 27) mounted within the frame on opposite sides thereof proximate the vertical side members and adjacent the clamping plates,

(c) a pair of first support arms (46, 47) fixedly mounted to and extending outwardly from said bottom member on a front side of the frame,



(d) means pivotally mounting a lower one (17) of said clamping plates to said first support arms,

(e) a pair of second support arms (24, 25) slidably mounted on and extending outwardly from said guide columns on the front side of the frame,

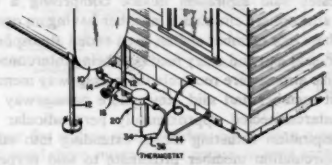
(f) means pivotally mounting an upper one (18) of said clamping plates to said second support arms, and

(g) means (28, 29) for moving said second support arms, including the upper clamping plate mounted to them, on said guide columns toward and away from the lower clamping plate.

4,191,524
FUEL OIL SUPPLY SYSTEM HAVING AN ELECTRICALLY HEATED FILTER

Michael R. Thorn, 107 E. Sherman St., Lynn, Ind. 47355

Filed Sep. 19, 1977, Ser. No. 834,116
Int. Cl.[2] F24D *11/44;* B01D *35/18;* F24H *1/12*
U.S. Cl. 431—208 4 Claims



1. In a fuel oil supply system for a fuel oil heater in a building including a storage tank for storing fuel oil located outside the building, a feed supply line running from said fuel oil tank to said building, a fuel oil heater in said building receiving fuel oil from said supply line, and a canister filter connected in said supply line for filtering fuel oil flowing therethrough, the improvement in said supply system comprising a means for heating said filter, including:

a heater enclosure defining a filter cavity sized to receive said canister filter and including a substantially cylindrical lower portion having a closed bottom and a substantially cylindrical cap portion, said lower portion and said cap portion interfitting to substantially completely enclose said filter in said filter cavity, said cap portion defining openings for passage of said supply line therethrough to and from said filter, said lower portion defining a plurality of weep holes around its periphery near the bottom

thereof, said heater enclosure further including means for joining said lower portion and said cap portion,

electrical heater means comprising a light bulb mounted in said filter cavity in said heater enclosure for providing a source of heat to said canister filter, said heater means further including means mounting said light bulb on the bottom of said lower portion below the canister filter, the bottom of said lower portion being sloped downwardly away from said light bulb toward the periphery of said lower portion whereby any condensate dropping on said bottom drains out through said weep holes, and

means for supplying electrical power to said light bulb whereby said canister filter and the fuel oil therein are heated and the viscosity of said fuel oil maintained at a sufficiently low level to insure adequate flow through said filter to said heater in said building.

4,191,525

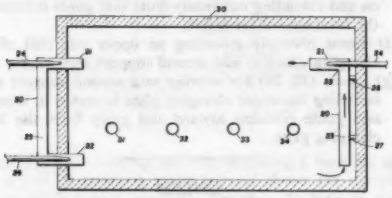
ASPIRATION CIRCULATION SYSTEM AND METHOD

Charles M. Sallman, Valparaiso, Ind., assignor to N L Industries, Inc., New York, N.Y.

Filed Mar. 30, 1978, Ser. No. 891,770

Int. Cl.[2] F26D *7/04*; F27B *3/22*

U.S. Cl. 432—21 **8 Claims**



1. A system for promoting temperature uniformity in a vessel having means for effecting temperature changes within said vessel and closure means for containing an atmosphere within an interior location of said vessel comprising a vessel atmosphere aspiration device in operative relationship with said vessel: said aspiration device comprising a tube-like shaped atmosphere circulation member having an open ended atmosphere exit member and an open ended atmosphere entry member, said exit and entry members being interconnected by a tube-like atmosphere recirculation passageway member with said exit member and said atmosphere passageway member being interconnected approximately perpendicular to each other; aspiration actuating means extending into said atmosphere circulation member proximate to said perpendicular interconnection and directed toward said vessel interior to a point beyond said perpendicular interconnection and into said exit member for passing an aspirating fluid into said exit member and thereby causing said vessel atmosphere to be aspirated through said atmosphere circulation member; and fluid introduction means connected to said aspiration actuating means for introducing a pressurized fluid into said aspiration actuating means; said aspiration device being operationally positioned with said vessel so that said open ended exit member and said open ended entry member extend through said closure means into an interior location of said vessel and said atmosphere passageway member is at a location that is exterior of said vessel closure means, whereby said vessel atmosphere may enter said open ended entry member, pass through said atmosphere passageway member and into said exit member, and exit back into the vessel through said exit member and thereby promote temperature uniformity within said vessel interior.

4,191,526

SUSPENSION GAS PREHEATER

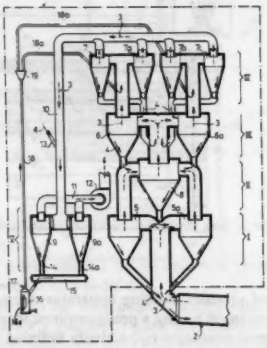
Wolfgang Triebel, Oelde, Fed. Rep. of Germany, assignor to Polysius AG, Neubeckum, Fed. Rep. of Germany

Filed Apr. 3, 1978, Ser. No. 892,739

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1977, 2715790

Int. Cl.[2] F27B *15/00*

U.S. Cl. 432—58 **13 Claims**



1. In a suspension gas preheater for preheating fine material, including a plurality of heat exchanger stages arranged one above the other in a stack through which material passes successively in a downward direction from one stage to a lower stage and through which gas flows upwards successively from one stage to a higher stage, wherein the plurality of heat exchanger stages includes an uppermost stage and a lowermost stage, the improvement therein comprising:

at least one additional heat exchanger stage positioned laterally adjacent the stack of the plurality of heat exchanger stages;

means for moving gas from the uppermost stage of the plurality of heat exchanger stages to and through said additional heat exchanger stage; and

a material feed system connecting said additional heat exchanger stage with the uppermost stage of the plurality of heat exchanger stages and including means for moving materials from said additional heat exchanger stage to the uppermost stage,

whereby the general direction of movement of gas is from the lowermost stage through the plurality of heat exchanger stages to said additional heat exchanger stage and the general direction of movement of materials is from said additional heat exchanger stage through the the plurality of heat exchanger stages to the lowermost stage.

4,191,527

APPARATUS FOR THE DEHYDRATION OF WASTE AND VEGETABLE MATTER

Charles Trouillard, Nantes, France, assignor to Hilda Bolli, Nyon, Switzerland

Filed Aug. 1, 1978, Ser. No. 930,045

Claims priority, application France, Aug. 4, 1977, 77 23999; Nov. 16, 1977, 77 34427

Int. Cl.[2] F23J *5/02*; F26B *11/04*; F27B *7/10*

U.S. Cl. 432—72 **10 Claims**

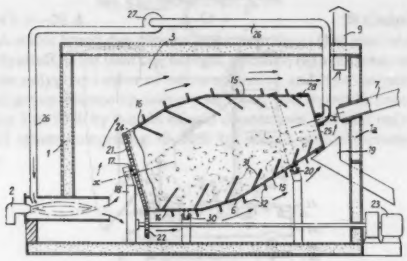
1. Apparatus for dehydrating organic waste material comprising

a heat insulated chamber,

a substantially closed oven within said chamber rotatably mounted with its axis inclined to the vertical with respect to the chamber,

means for rotating the oven about its axis,

burner means for providing heat directly to the interior of said chamber to heat the oven to cause the waste therein to give off vapors,



and conduit means connecting the oven directly to said burner means and provided with a fan which ensures the flow of the vapors from the oven to the burner means for decomposition.

4,191,528

TANK BLOCK

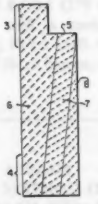
Paul Boggum, and Klaus Schulte, both of Wiesbaden, Fed. Rep. of Germany, assignors to Didier-Werke A.G., Wiesbaden, Fed. Rep. of Germany

Division of Ser. No. 750,412, Dec. 14, 1976, Pat. No. 4,130,391. This application Jun. 5, 1978, Ser. No. 912,251

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1975, 2557242

Int. Cl.² F27B *14/06*

U.S. Cl. 432—248 **9 Claims**



1. A tank block, for use in forming the walls of a glass-tank furnace, and of the type having an inner surface which faces a glass melt within the furnace, an outer surface facing away from the glass melt, an upper or head portion having therein a recess facing the outer surface, and a lower or base portion, said tank block comprising, in sequence from said inner surface to said outer surface:

an inner layer formed of a material which is highly resistant to corrosion by said glass melt, said inner layer having a thickness at said head portion extending at least to said recess said inner layer being wedge-shaped and having a thickness decreasing from a maximum at said head portion to a minimum at said base portion;

a central layer firmly joined to said inner layer and formed of a material which is less resistant to corrosion by said glass melt than said material of said inner layer; and

an outer insulating layer firmly joined to said central layer.

4,191,529

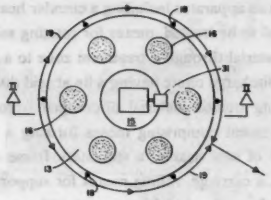
FURNACE FOR HEATING SOLIDS

John B. Harrell, Pittsburgh; William F. Barraclough, Corapolis, both of Pa., and Curtis O. Pederson, Urbana, Ill., assignors to Salem Furnace Co., Pittsburgh, Pa.

Filed Oct. 11, 1978, Ser. No. 950,455

Int. Cl.² F27B *1/20*

U.S. Cl. 432—98 **6 Claims**



1. A furnace for transferring heat to divided solids, comprising an annular heating chamber having inner and outer walls and a discharge opening around the lower end of its inside wall, a plow arm affixed to a central vertical axle positioned to rotate within the said discharge opening and plow heated divided solids therethrough, heating elements positioned below said discharge opening, an effluent gas offtake in the upper portion of the annular chamber, divided solids feeding chutes positioned in the upper portion of the annular chamber extending into the chamber to a level below the effluent gas offtake, and means connected with the central vertical axle for rotating the axle.

4,191,530

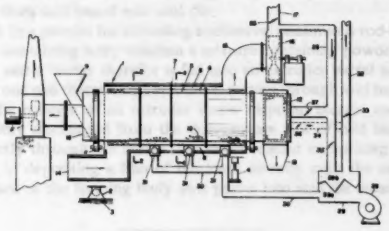
DRYER

Wendell E. Bearce, Box 241, St. Clairsville, Ohio 43950

Filed Sep. 21, 1978, Ser. No. 944,573

Int. Cl.² F27B *7/08*

U.S. Cl. 432—107 **2 Claims**



1. A dryer for drying wet particles, comprising a substantially horizontal drum mounted for rotary driving movement about its axis, a hopper for introducing said wet particles into one end opening of said drum, a stationary housing spaced from and surrounding said drum, burners in said housing for heating said drum, an exhaust opening at the opposite end of said housing for exhausting products of combustion of said housing, means including a fan for sucking air and moisture from said one end of said drum for maintaining a negative pressure in said drum, means for recirculating exhaust air from said opposite end of said housing so as to recirculate spent products of combustion and increase the efficiency of said dryer, said recirculating means including a heat exchange unit having one compartment powered by a blower for blowing draft air into said burners and another compartment of the heat exchange unit connected to said recirculating means and to a chimney, and a damper means for enabling selective flow of said spent products of combustion from said other end of said housing to either said last mentioned compartment of said heat exchange unit or to said chimney.

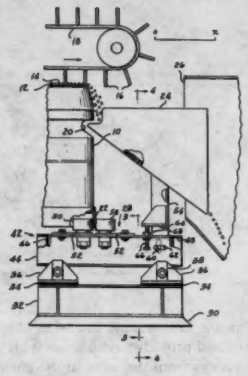
4,191,531

DISCHARGE CHUTE ASSEMBLY FOR CALCINING HEARTH

Percy V. Bourne, Scarborough, Canada, assignor to Calcimatic International Limited, Grand Cayman, Cayman Islands

Filed Apr. 6, 1978, Ser. No. 893,893
Int. Cl.[2] F27D 3/00
U.S. Cl. 432—239 6 Claims

1. In an apparatus including a circular hearth for supporting material to be treated, means for rotating said hearth to carry said material through a treatment zone to a discharge station, and a discharge chute having a lip at said discharge station for receiving treated material discharged from said hearth, the improvement comprising means forming a recess below the surface of said hearth, a stationary frame at said discharge station, a carriage, rolling means for supporting said carriage on said frame for radial movement with respect to said hearth, adjustable means mounting said chute on said carriage, said adjustable means permitting vertical and radial adjustment of the position of said chute on said carriage to locate said lip in said recess, a peripheral flange on said hearth having inner and outer sides, and respective rollers on said carriage engaging said sides of said flange for maintaining a relatively constant



radial position of said chute relative to the portion of said hearth at said discharge station.

4,191,532

ORGANIC COMPOUNDS

Rolf Gross, Reinach, and René Fricker, Allschwil, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Jan. 26, 1978, Ser. No. 872,407
Int. Cl.[2] D06P *1/00, 1/39*
U.S. Cl. 8—21 A 28 Claims

1. A stable liquid dye concentrate comprising (1) at least one acid dyestuff, (2) at least one cationic dyestuff, (3) a nonionic or anionic polyglycol ether or mixture thereof, and (4) a cationic amino group-containing polyglycol ether, said dyestuffs comprising 5 to 50% by weight of said concentrate and said polyglycol ethers comprising 10–50% by weight of said concentrate.

4,191,533

PREGNANCY-SPECIFIC β_1-GLYCOPROTEIN AND PROCESS FOR ISOLATING IT

Hans Bohn, Marburg, and Ferdinand Stutzinger, Bretzenheim, both of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Fed. Rep. of Germany. Continuation-in-part of Ser. No. 842,163, Oct. 14, 1977, abandoned, which is a division of Ser. No. 569,476, Apr. 18, 1975, Pat. No. 4,065,445, which is a continuation-in-part of Ser. No. 292,735, Sep. 27, 1972, abandoned. This application Dec. 9, 1977, Ser. No. 858,890

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1971, 2148587; Nov. 20, 1971, 2157610
Int. Cl.[2] G01N *33/16;* A23J *1/06;* A61K *39/00*
U.S. Cl. 23—230 B 1 Claim

1. A method for detecting the presence of a pregnancy-specific β_1-glycoprotein in the blood or urine of a female animal or woman, whereby a pregnancy can be detected and supervised, which comprises contacting a sample of the blood or urine to be tested with antiserum to said pregnancy-specific β_1-glycoprotein and examining the sample for evidence of an immune reaction, said pregnancy-specific β_1-glycoprotein having an electrophoretic migration speed in agar gel in the range of β_1-globulins, a sedimentation constant of 4.6 S±0.5 S, a molecular weight of about 100 000±15 000, an extinction coefficient $E_{1\ cm}^{1\%}$ of 11.6±0.5 (278 mμ; 1/15-molar phosphate buffer, pH 7.0), and a carbohydrate content of 28.05±1.55%, comprising 10.7±1.0% of hexoses, 10.0±0.5% of hexosamine, 0.55±0.05% of fucose, and 7.0±0.5% of neuraminic acid.

4,191,534

FUEL LOG AND METHOD OF MAKING IT

Joseph M. Bostic, P.O. Box 121, White Sulphur Springs, W. Va. 24986

Filed Jul. 19, 1978, Ser. No. 926,093
Int. Cl.[2] C10L *9/00, 5/00*
U.S. Cl. 44—6 10 Claims

6. A fuel log formed of a mixture of coal granules and a combustible, liquid contact cement by pulverizing raw coal to form granules having diameters of no more than about 0.25 inch and, spreading the granules in no more than a few layers on a conveyor, dispensing the granules from said conveyor into a mixing hopper, laterally spraying the cement into the path of said falling particles to uniformly coat the surface of each particle and compacting the mixture into an elongate configuration.

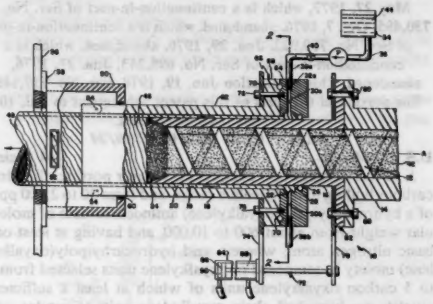
7. The fuel log of claim 6, including a combustible covering jacket covering a surface of said log.

4,191,535

COAL EXTRUSION APPARATUS AND PROCESS

Anthony H. Furman, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 25, 1978, Ser. No. 945,442
Int. Cl.[2] C10L *5/00, 5/22*
U.S. Cl. 44—10 R 16 Claims



1. In an apparatus for extruding a cohesive, continuous rod-like coal-containing body including:
(a) an extruder barrel,
(b) an extruder screw disposed within said barrel,
(c) means for feeding a mixture containing powdered coal and a binder therefor into said barrel,
(d) means operatively associated with said screw for driving said screw, and
(e) die means operatively associated with and disposed adjoining the discharge portion of said barrel for receiving and shaping the mixture forcibly discharged from said barrel discharge portion,
the improvement comprising, in combination with the above,
(f) means for depositing a film of lubricant directly onto the outer surface of the forming body as it passes directly from said barrel into said die.

12. In a process for extruding a cohesive, continuous rod-like coal-containing body wherein a mixture containing powdered coal and a binder therefor is fed into an extruder barrel adjacent one end thereof, said mixture is moved through said barrel by the rotation of an extruder screw disposed therein and is forcibly discharged from the downstream end of said barrel directly through die means, the improvement comprising the step of depositing a film of lubricant directly onto the outer surface of the forming body as it passes into said die means.

4,191,536

FUEL COMPOSITIONS FOR REDUCING COMBUSTION CHAMBER DEPOSITS AND HYDROCARBON EMISSIONS OF INTERNAL COMBUSTION ENGINES

Leonard M. Niebylski, Birmingham, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Jul. 24, 1978, Ser. No. 927,496
Int. Cl.[2] C10L *1/14*
U.S. Cl. 44—63 21 Claims

1. As a composition of matter, a gasoline for a spark ignited internal combustion engine comprising a mixture of (i) hydrocarbons boiling within the gasoline range, (ii) a cyclopentadienyl manganese tricarbonyl antiknock compound wherein said cyclopentadienyl is a hydrocarbon group having from 5 to 17 carbon atoms in an amount sufficient to improve the antiknock characteristics of said gasoline, and (iii) an exhaust emission and engine deposit reducing amount of tetrahydrofuran.

4,191,537
FUEL COMPOSITIONS OF POLY(OXYALKYLENE) AMINOCARBAMATE

Robert A. Lewis, Berkeley, and Lewis R. Honnen, Petaluma, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 887,703, Mar. 17, 1978, abandoned, which is a continuation-in-part of Ser. No. 801,441, May 27, 1977, which is a continuation-in-part of Ser. No. 730,495, Oct. 7, 1976, abandoned, which is a continuation-in-part of Ser. No. 700,922, Jun. 29, 1976, abandoned, which is a continuation-in-part of Ser. No. 698,243, Jun. 21, 1976, abandoned. This application Jun. 19, 1978, Ser. No. 917,149
The portion of the term of this patent subsequent to Jul. 10, 1996, has been disclaimed.
Int. Cl.[2] C10L *1/22*; C07C *69/24*
U.S. Cl. 44—71 **41 Claims**

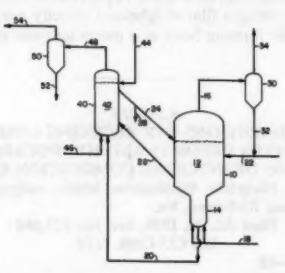
1. A fuel composition comprising a major portion of hydrocarbons boiling in the gasoline range, and from 30 to 2,000 ppm of a hydrocarbylpoly(oxyalkylene) aminocarbamate of molecular weight from about 600 to 10,000, and having at least one basic nitrogen atom; wherein said hydrocarbylpoly(oxyalkylene) moiety is composed of oxyalkylene units selected from 2 to 5 carbon oxyalkylene units of which at least a sufficient number are branched chain oxyalkylene units to render said carbamate soluble in said fuel composition; and said hydrocarbyl group contains from 1 to about 30 carbon atoms.

39. A concentrate of a deposit control additive for fuel compositions comprises an inert stable oleophilic organic solvent boiling in the range of from about 150° to 400° F. and from 10 to 50 weight percent of a hydrocarbyl poly(oxyalkylene) aminocarbamate of molecular weight from about 600 to 10,000, and having at least one basic nitrogen atom; wherein said hydrocarbyl poly(oxyalkylene) moiety is composed of oxyalkylene units selected from 2 to 5 carbon oxyalkylene units of which at least a sufficient number are branched chain oxyalkylene units to render said carbamate soluble in hydrocarbons boiling in the gasoline range; and said hydrocarbyl group contains from 1 to about 30 carbon atoms.

4,191,538
SYNTHETIC CO_2 ACCEPTOR AND GASIFICATION PROCESS THEREWITH

Everett Gorin, San Rafael, Calif., assignor to Continental Oil Company, Stamford, Conn.

Filed Mar. 12, 1979, Ser. No. 20,003
Int. Cl.[2] C10J *3/00, 3/54*
U.S. Cl. 48—197 R **6 Claims**



1. A synthetic CO_2 acceptor consisting essentially of at least one chemically uncombined calcium compound selected from the group consisting of calcium oxide and calcium carbonate supported in a refractory carrier matrix, said carrier having the general formula

$$3CaO(SiO_2)_x(Al_2O_3)_{1-x}$$

wherein x is from about 0 to about 1 and wherein said chemically uncombined calcium compound is present in an amount equal to from about 10 to about 20 weight percent, calcium oxide equivalent based on the weight of the acceptor.

2. In a process for producing a synthesis gas by reacting a carbonaceous feedstock with water in the presence of a carbon dioxide acceptor to produce a synthesis gas rich in hydrogen with at least a portion of the carbon dioxide so produced being reacted with said calcium oxide to produce calcium carbonate, the improvement wherein, said CO_2 acceptor consists essentially of at least one chemically uncombined calcium compound selected from the group consisting essentially of calcium oxide and calcium carbonate supported in a refractory carrier matrix, said carrier having the general formula

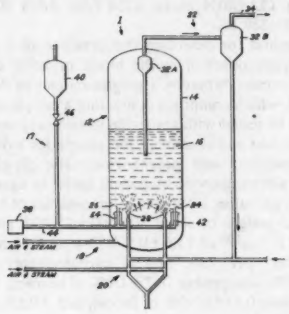
$$3CaO(SiO_2)_x(Al_2O_3)_{1-x}$$

wherein x is from about 0 to about 1 and wherein said chemically uncombined calcium compound is present in an amount equal to from about 10 to about 20 weight percent, calcium oxide equivalent based on the weight of the acceptor.

4,191,539
METHOD FOR FEEDING CAKING COAL PARTICLES TO A GASIFIER

Jitendra G. Patel, Bolingbrook; Frank C. Schora, Palatine, and John W. Loeding, Naperville, all of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Continuation-in-part of Ser. No. 693,352, Jun. 7, 1976, abandoned. This application Aug. 15, 1977, Ser. No. 824,352
Int. Cl.[2] C10J *3/54*
U.S. Cl. 48—210 **3 Claims**



1. In a process for converting caking carbonaceous particles into a fuel gas utilizing an elongated reactor having a reactor wall and an axis therethrough, a fluidized bed in the bottom portion thereof maintained at conditions to convert said carbonaceous particles to fuel gas and means for withdrawing ash from the center, bottom portion of said reactor, the improved method of adding said carbonaceous particles to said fluidized bed which comprises:

introducing a high velocity gas stream having a velocity of 50 to 300 feet per second in admixture with said carbonaceous particles directly into the bottom of said fluidizied bed without prior pretreatment of the carbonaceous particles at a plurality of equally spaced-apart points around the perimeter of the reactor; said fluidized bed operating at a temperature within the range of about 1800°–2000° F., said gas stream being introduced into said bed at a predetermined high velocity at a location in close proximity to the reactor wall and a substantial distance away from said centrally located withdrawal means, whereby said carbonaceous particles are rapidly mixed with and shock heated by contact with the fluidized bed, said high velocity gas stream and admixed carbonaceous particles being passed substantially directly upward directly into the bottom of

said fluidized bed in a direction substantially parallel to the axis of the reactor without substantially altering the stability of the fluidized bed and the residence time distribution of the carbonaceous particles in the bed.

4,191,540

CARBON DIOXIDE ACCEPTOR PROCESS USING COUNTERCURRENT PLUG FLOW

David S. Mitchell, and David R. Sageman, both of San Rafael, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Mar. 27, 1978, Ser. No. 890,886

The portion of the term of this patent subsequent to Jun. 5, 1996, has been disclaimed.

Int. Cl.[2] C10J 3/54

U.S. Cl. 48—197 R **10 Claims**

1. A CO_2 acceptor gasification process for gasifying a solid carbonaceous material in a gasification zone, which comprises:

introducing into an upper portion of the gasification zone particulate CO_2 acceptor solids at an elevated temperature;

passing said particulate CO_2 acceptor solids downwardly through the gasification zone;

introducing into a lower portion of the gasification zone particulate carbonaceous solids, the physical characteristics of the CO_2 acceptor solids and the carbonaceous solids differing such that a gas flowing upwardly through the gasification zone at a velocity greater than that necessary to fluidize the CO_2 acceptor solids and at a velocity less than that necessary to entrain said CO_2 acceptor solids will entrain the carbonaceous solids;

passing a fluidization gas containing steam upwardly through the gasification zone at a rate sufficient to fluidize the CO_2 accepto.' solids and entrain the carbonaceous solids, whereby at least a portion of said steam reacts with at least a portion of said carbonaceous solids to form a gaseous product containing CO_2, which CO_2 substantially reacts with the CO_2 acceptor solids to form spent acceptor solids;

maintaining substantially plug flow of the solids and gases throughout said gasification zone by limiting gross vertical backmixing of said solids and gases;

withdrawing effluent solids, including CO_2 acceptor solids and spent acceptor solids from a lower portion of said gasification zone; and

removing from an upper portion of said gasification zone the remaining fluidization gas, the remaining gaseous product and the remaining entrained carbonaceous solids.

4,191,541

METHOD AND APPARATUS FOR GAS SAMPLE ANALYSIS

Charles W. Jenkins, Fernandina Beach, Fla., assignor to Container Corporation of America, Chicago, Ill.

Filed Aug. 14, 1978, Ser. No. 933,567

Int. Cl.[2] B01D 53/14

U.S. Cl. 55—18 **21 Claims**

1. Apparatus for withdrawing a gas from a source and conditioning the gas for subsequent analysis for total reduced sulfur content, which comprises:

a gas probe having an inlet for a stream of gas and an outlet therefor,

a conduit, having electrical resistance means to provide heat to a gas stream flowing therein, extending from the probe outlet to a condenser,

said condenser having a passage through which a gas stream can flow and be cooled by indirect heat exchange with a cooling fluid and vapor in the gas condensed to liquid,

a second conduit from the condensor passage to a means for producing a vacuum which causes a gas stream to enter the probe and flow through the heatable conduit to and through the condenser passage and the second conduit,

a third conduit for delivering a stream of gas from the second conduit to a scrubber to wash the gas stream with a scrubbing liquid,

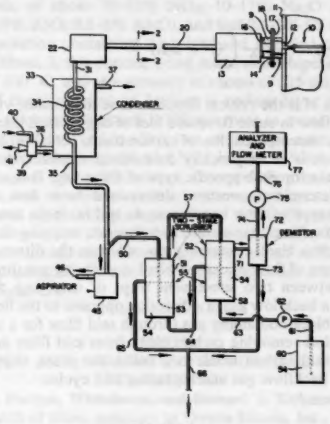
means for removing the gas stream from the scrubber and separating entrained scrubbing liquid, and

means for pumping the scrubbed gas stream, from which scrubbing liquid has been removed, to an analyzer and flow meter.

15. A method comprising:

withdrawing a stream of hot gas containing water vapor from a source believed to contain a gaseous reduced sulfur content,

continuously maintaining the withdrawn stream of hot gas at a temperature above the dew point temperature of the gas,



feeding the stream of hot gas to a condenser to condense the water vapor from the gas,

removing the condensed water with the stream of previously hot but now cooled gas from the condenser,

diverting a minor portion of the cooled gas stream, substantially devoid of water, to a scrubber,

scrubbing the cooled gas stream in the scrubber with a scrubbing liquid,

withdrawing the scrubbed gas stream from the scrubber,

separating residual scrubbing liquid from the scrubbed gas stream, and

feeding the scrubbed gas stream to an analyzer and flow meter to determine the total reduced sulfur content in the gas stream.

4,191,542

FILTERING PROCESS FOR A CARBON BLACK-CONTAINING GAS

Paul J. Cheng, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

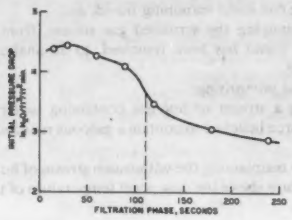
Continuation-in-part of Ser. No. 563,402, Mar. 31, 1975, abandoned. This application May 4, 1978, Ser. No. 902,656

Int. Cl.[2] B01D 46/04

U.S. Cl. 55—96 **6 Claims**

2. A process for recovering carbon black from a carbon black-containing gas comprising passing said carbon black-containing gas through a filter for a filtration phase which is at least as long as a critical filtration time and up to 50 percent longer, said critical filtration time being defined as the filtration phase at which the linearly plotted curve of the initial filter

pressure drop versus the filtration phase has an inflection point and represented by the general formula



$$(cf) = \frac{1}{(cs)(vf)}\left(\frac{A}{S} + B(cs)\right)$$

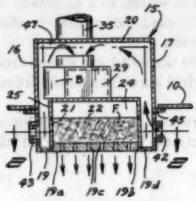
wherein cf is the critical filtration time in seconds; vf is actual (a) gas flow in cubic ft/square foot of bag surface/minute; cs is smoke concentration, lbs. of carbon black/actual (a) cubic foot of gas; A is an empirically determined constant, determined from data for each specific type of filter bag; B is an empirically determined constant, determined from data for each specific type of filter bag as was A; and (a) is the actual cubic feet at the filter temperature and pressure; stopping the flow of said carbon black-containing gas, wherein the filtration phase is the time of flow of carbon black-containing gas through the filter between two subsequent steps of emptying the filter; passing a backflow gas in a direction opposite to the flow of the carbon black-containing gas through said filter for a backflow phase, thus removing carbon black from said filter and transferring said carbon black to a collection point, stopping the flow of backflow gas and repeating said cycles.

4,191,543

STERILE AIR RECYCLING APPARATUS

Max D. Peters, 633 Turnpike Rd., Minneapolis, Minn. 55416

Filed Dec. 23, 1977, Ser. No. 863,911
Int. Cl.² B01D *46/42, 46/54*
U.S. Cl. 55—279 **7 Claims**



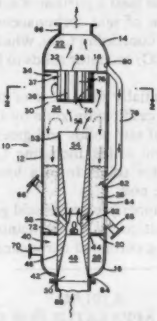
1. Sterile air recycling apparatus mountable on a wall of a room for discharging air into the room interior comprising a housing having walls joined together to form a generally rectangular box shaped enclosure, the housing walls including a front wall, a rear wall, and opposite side walls, said front wall having an outlet opening, high efficiency filter means mounted within the housing in fluid communication with the front wall opening for discharging filtered air therethrough, a blower within the housing and having an inlet and an outlet, means for attaching the blower to the housing, means within the housing and connected to the blower outlet and to the filter means for placing the blower outlet in fluid communication with the filter means to supply air under pressure to the filter means to flow therethrough to the front wall outlet opening, the filter means including a HEPA filter, the blower, the filter means and the means for connecting the blower outlet to the filter means being connected to one another and mounted in housing to in conjunction with the housing define a space within the housing that comprises a negative pressure plenum chamber, the blower inlet opening to the negative pressure plenum to draw air therefrom, the opposite side walls each having a room air inlet opening to the negative pressure plenum chamber for having air drawn therethrough and into the negative pressure plenum chamber by the blower, the housing having a fresh air inlet opening to the negative pressure plenum chamber, and means connected to the housing for supplying fresh air from exterior of the room to the fresh air inlet, the means for placing the blower outlet in fluid communication with the filter means including wall means that in conjunction with the filter means defines a supply pressure plenum chamber in fluid communication with the filter means and having an inlet, and duct means connected between the blower outlet and the wall means for fluidly connecting the blower outlet to the supply pressure plenum chamber means inlet.

4,191,544

GAS CLEANING APPARATUS

Richard H. Boll, and Walter C. Lapple, both of Alliance, Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Mar. 17, 1978, Ser. No. 887,579
Int. Cl.² B01D *53/12*
U.S. Cl. 55—390 **2 Claims**



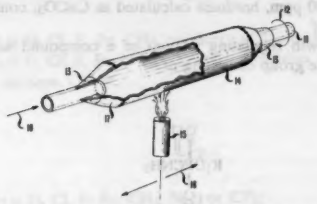
1. A gas cleaning apparatus comprising a vessel, transverse plates dividing the vessel into upper, intermediate and lower chambers, a fluidized bed of contaminant adsorbing particles, the fluidized bed occupying a lower portion of the intermediate chamber, venturi-shaped duct means disposed within the vessel and having a gas outlet communicating with the intermediate chamber at a level above the fluidized bed, the duct means being formed with a constricted interior passage, means for admitting a stream of contaminated gas to the duct means, conduit means connecting the fluidized bed with the constricted passage to introduce the adsorbing particles into the gas stream thereby removing contaminants therefrom, means for centrifugally separating contaminant-laden particles from the gas stream, the separating means being disposed above and in spaced coaxial relation with the duct means and having a gas inlet communicating with the intermediate chamber and a gas outlet communicating with the upper chamber, means for discharging substantially decontaminated gas from said upper chamber, and means for returning the separated particles to said fluidized bed.

4,191,545

OPTICAL FIBER FABRICATION PROCESS

John B. MacChesney, Lebanon; Paul B. O'Connor, Plainfield, and Arthur D. Pearson, Bernardsville, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 2, 1979, Ser. No. 16,787
Int. Cl.² C03B 37/02
U.S. Cl. 65—3 A 23 Claims



1. A method of forming an optical fiber comprising
rotating a substantially cylindrical mandrel about its longitudinal axis;
forming amorphous, powdery particles;
depositing the particles on the substantially cylindrical mandrel to form an intermediate tubular structure comprising amorphous, powdery particles;
fusing the intermediate tubular structure into a transparent tubular glass structure;
depositing additional material on the tubular glass structure; and
drawing the structure into a fiber, the invention characterized in that
the intermediate tubular structure is removed from the mandrel prior to fusion and is constrained against shrinkage in both the longitudinal and radial direction during fusing.

4,191,546

PROCESS OF MAKING A BLISTERED, CRYSTALLIZABLE GLASS MATERIAL

Karl K. K. Kroyer, Engtoften 3, DK-8260 Viby J., Denmark

Filed Dec. 28, 1977, Ser. No. 865,282
Claims priority, application United Kingdom, Jan. 4, 1977, 47/77
Int. Cl.² C03B 19/08
U.S. Cl. 65—20 16 Claims

1. A process of making a blistered crystallizable glass material with simultaneous utilization of mineral-containing waste products comprising the steps of:
supplying to the upper end of a rotary kiln as raw materials a mixture of materials originating from domestic or industrial waste products with calcareous materials and optionally other glass-forming minerals in such a mix proportion that the finished glass material made therefrom will show a content of about 20–30% by weight CaO and no more than about 5% by weight Al_2O_3 keeping said rotary kiln at a temperature sufficient to melt the raw materials supplied during their passage therethrough to form a molten bath flowing downwards through the lower part of said rotary kiln causing the molten material thus formed to flow off from the lower end of said kiln and subsequently cooling said material thereby to form a blistered crystallizable material.

4,191,547

METHOD OF MAKING PHOTOSENSITIVE COLORED GLASSES EXHIBITING ALTERABLE PHOTO-ANISOTROPIC EFFECTS

Che-Kuang Wu, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Jul. 14, 1978, Ser. No. 924,508
Int. Cl.² C03C 21/00
U.S. Cl. 65—30 R 18 Claims

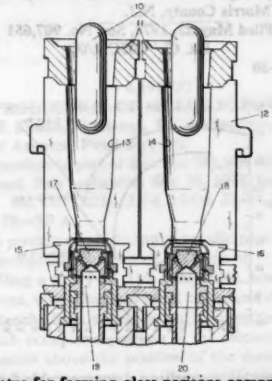
1. A method for making a photosensitive colored glass article exhibiting alterable photo-anisotropic effects consisting of a body portion and an integral hydrated surface layer of a thickness about 1–500 microns having Ag-AgCl-containing crystals therein, at least a portion of which exhibits photo-dichroic and birefringent properties, which comprises contacting an anhydrous glass body consisting essentially, in mole percent of the oxide basis, of about 70–82% SiO_2, 10–17% Na_2O and/or K_2O, 5–15% ZnO, 0.5–5% Al_2O_3, and and 0.1–3% Cl with an aqueous solution containing Ag^+ ions and acidified to a pH less than about 2, this contact being made at a temperature in excess of 200° C. and at a pressure in excess of 225 psig. for a period of time sufficient to hydrate a surface layer thereon having a thickness of about 1–500 microns, to cause the replacement of Na^+ and/or K^+ ions with Ag^+ ions in said hydrated glass, the proportion of Na^+ and/or K^+ ions in said hydrated glass being less with a corresponding increase in Ag^+ ions, and to cause a reaction between Ag^+ ions and Cl^- ions in said hydrated glasses to form Ag-AgCl-containing crystals therein, and thereafter to expose said surface layer to ultraviolet radiation at an intensity and for a time sufficient to develop photo-dichroic and birefringent properties in at least a portion thereof.

4,191,548

METHOD AND APPARATUS FOR FORMING GLASS CONTAINERS

John M. Fortner, Whitehouse, and Richard T. Kirkman, Maumee, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed May 17, 1978, Ser. No. 906,707
Int. Cl.² C03B 9/36
U.S. Cl. 65—79 6 Claims



1. Apparatus for forming glass parisons comprising:
an annular neck mold formed of two matching halves positioned beneath said parison mold in axial alignment therewith;
a plunger having a relatively flat, horizontal face positioned axially within said neck mold, said plunger having its horizontal face provided with shallow, concentric grooves;
face relief means formed in one neck mold half at the inter-

face of the parting line between said neck mold halves in the area of the thread-forming portion of the neck mold halves;

an annular guide ring mounted in said neck mold for guiding the neck pin;

a retractable thimble having its upper end sealingly engageable with said guide ring;

passage means extending upwardly through said guide ring and thimble at circumferentially spaced points;

a source of vacuum; and

means connecting said vacuum to said thimble, said vacuum being in communication with said guide ring for applying a vacuum to the face relief area of said neck mold.

4,191,549

SOLAR CHEMICAL PROCESS FOR SLUDGE TREATMENT

Michael Boyko, 1308 Jasmine St., Denver, Colo. 80220

Continuation of Ser. No. 766,206, Feb. 7, 1977, abandoned. This application Aug. 22, 1978, Ser. No. 935,962

Int. Cl.[2] C05F *13/00*

U.S. Cl. 71—13 **18 Claims**

1. A process for converting dewatered gelatinous sewage sludge from a gelatinous material into a granular manageable material adapted for use as fertilizer, comprising:

(a) combining fibrous cellulose waste material with dilute acid solution,

(b) heating the combined acid and cellulose for an empirically determined time during which the acid and cellulose react, turning the cellulose into a dry substantially black carbonaceous product,

(c) mixing said dry black product with gelatinous sewage sludge in an empirically determined ratio, converting the sludge and black product mixture into a granular manageable material.

4,191,550

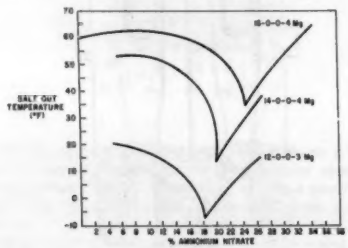
STORAGE-STABLE NITROGEN-MAGNESIUM FOLIAR SPRAY COMPOSITIONS

Edwin F. Hawkins, and Thomas M. Parham, Jr., both of Baton Rouge, La., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed May 22, 1978, Ser. No. 907,651

Int. Cl.[2] C05C *9/00*

U.S. Cl. 71—30 **6 Claims**



1. A composition comprising a storage-stable fertilizer concentrate solution of a pH of between about 4 and 7 consisting essentially of water, about 18% to 28%, by weight, of magnesium nitrate solute, about 14% to 32% by weight, of ammonium nitrate solute, and about 3.5% to 8%, by weight, of urea, said composition having an ammonium nitrate to urea weight ratio of between about 3.5:1 and 5:1 and a nitrogen to magnesium weight ratio of between about 1.5:1 and 5:1 and a salt-out temperature below about 30° F.

4,191,551

GROWTH RETARDANTS

Willis E. Cupery, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 25, 1978, Ser. No. 909,555

Int. Cl.[2] A01N *9/36*

U.S. Cl. 71—86 **11 Claims**

1. A growth regulating spray solution, said solution including water which contains calcium and magnesium ions in excess of 100 ppm, hardness calculated as $CaCO_3$, consisting essentially of

(1) a growth regulating amount of a compound selected from the group consisting of

wherein R_1 is alkyl of 1 to 3 carbon atoms or allyl; and M is potassium, sodium, lithium or ammonium; and

(2) an effective amount of a chelating agent capable of tieing up at least a portion of the calcium ions.

4,191,552

AMINE SALTS OF SUBSTITUTED N-PHOSPHONOMETHYLUREAS AND THEIR USE AS PLANT GROWTH REGULATORS

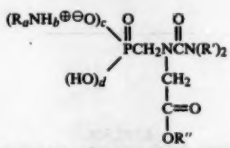
George B. Large, Orinda, and Lawrence Buren, Cupertino, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Feb. 2, 1979, Ser. No. 8,719

Int. Cl.[2] A01N *5/00*; C07C *101/24*

U.S. Cl. 71—86 **27 Claims**

1. A compound having the formula



in which

R, R', and R'' are independently C_1–C_4 alkyl;

a is 1 or 2 and b is 2 or 3, such that the sum of a and b is 4; and

c is 1 or 2 and d is 0 or 1, such that the sum of c and d is 2.

4,191,553

HERBICIDAL SULFAMATES

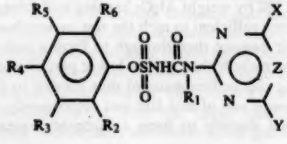
James J. Reap, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 2, 1978, Ser. No. 882,918

Int. Cl.[2] A01N *9/22*

U.S. Cl. 71—92 **48 Claims**

1. A compound having the formula



I

wherein

R_1 is H, OCH_3 or alkyl of 1–3 carbons;

R_2 is H, Cl, F, Br, NO_2, alkyl of 1–4 carbons, alkoxy of 1–4 carbons, CF_3 or

R_3 is H, Cl, F, Br, CH_3, or alkoxy of 1–4 carbons;

R_4 is H, Cl, F, Br, NO_2, alkyl of 1–4 carbons, alkoxy of 1–4 carbons, CN or

R_5 is H, Cl, F, Br, CH_3, NO_2 or CF_3;

R_6 is H, Cl, F, Br, alkyl of 1–4 carbons or alkoxy of 1–4 carbons;

R_7 is NaO, OH, or alkoxy of 1–4 carbons;

X is CH_3, CH_3CH_2, alkoxy of 1–3 carbons, CH_3OCH_2, $CH_3OCH_2CH_2O$, CH_3S, CH_3CH_2S, CF_3 or Cl; and

Y is CH_3, CH_3CH_2, alkoxy of 1–3 carbons, CH_3OCH_2, $CH_3OCH_2CH_2O$, CH_3S or CH_3CH_2S;

Z is CH or N;

provided that

only one of R_2, R_3 or R_4 is alkoxy; and

when R_5 is NO_2, R_4 is other than NO_2.

33. A method for protecting against the growth of undesired vegetation which comprises applying to the locus to be protected an herbicidally effective amount of a compound of claim 1.

4,191,554

HERBICIDAL BENZAMIDES

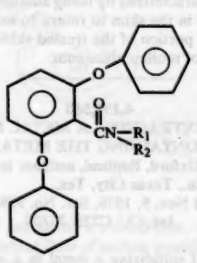
Walter A. Gregory, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 3, 1977, Ser. No. 838,958

Int. Cl.[2] C07C *103/80*; C07D *295/18*; A01N *9/20, 9/22*

U.S. Cl. 71—95 **21 Claims**

1. A compound of the formula:



where

R_1 is hydrogen, methyl, or ethyl;

R_2 is alkyl of 1–4 carbon atoms, methoxy or cyanomethyl; and

R_1 and R_2 together can be $—(CH_2)_4—$, provided that when R_2 is alkyl of 3 or 4 carbon atoms, methoxy or cyanomethyl, R_1 cannot be ethyl.

4,191,555

MONAZA AMIDES AND AMINES AS ETHYLENE INHIBITORS

Jonathan M. Kliegman, Wayne, N.J., assignor to GAF Corporation, New York, N.Y.

Filed Jul. 14, 1978, Ser. No. 924,741

Int. Cl.[2] A01N *5/00*

U.S. Cl. 71—95 **9 Claims**

1. The process of inhibiting ethylene generated by a plant, which comprises contacting said plant with an effective amount of the composition of a monaza compound selected from the group of N-methyl-2-pyrrolidone and 2-pyrrolidone and inert carrier therefor.

4,191,556

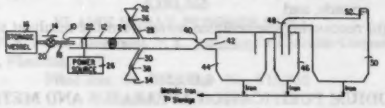
PROCESS FOR REDUCING METAL OXIDES TO METAL

Stephen H. Rothblatt, 2100 Lincoln Park West, Apt. 10AN, Chicago, Ill. 60614

Filed Jan. 30, 1978, Ser. No. 873,415

Int. Cl.[2] B22F *9/00*

U.S. Cl. 75—0.5 B **6 Claims**



1. A process for reducing metal oxides to metal comprising the steps of:

establishing a flow of heat reducing gas;

entraining particles of a metal oxide in said flow of heated reducing gas; and

directing said flow of heated reducing gas and entrained particles through a constriction-expansion nozzle for promoting a reduction reaction therebetween.

4,191,557

PRODUCTION OF METALLIC POWDERS

Thomas J. Kondis, Pittsburgh, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 781,109, Mar. 25, 1977, abandoned. This application Sep. 25, 1978, Ser. No. 945,324

Int. Cl.[2] C22B *13/04, 23/04, 25/04, 34/32*

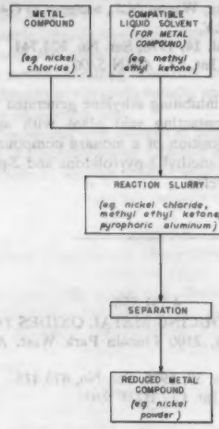
U.S. Cl. 75—0.5 A **11 Claims**

1. The process of producing a metallic powder by reducing a metal compound comprising the steps of:

(a) milling a slurry of (1) a compatible, non-aqueous liquid solvent, which has said metal compound dissolved therein to thereby form a solution and (2) a reactive metal powder which occupies a position in the electromotive series of elements above the position of the metal constituent in said metal compound, i.e. has a single electrode potential more negative than that of the metal constituent in said metal compound, said reactive metal powder being sufficiently reactive to reduce the metal constituent in said metal compound upon contact during the milling of said slurry as said reactive metal is made active by the milling, competing side reactions between the solvent and the active metal surfaces generated during the milling not progressing beyond self-limiting surface reactions, whereby the reduced metal appears as a finely divided

solid, said reactive metal being aluminum, the finely divided reduced metal solid being characterized by an ability to be cleaned of residual aluminum or aluminum compounds; and

(b) recovering the reduced metal from the resultant slurry.



4,191,558

SODIUM PURIFICATION APPARATUS AND METHOD

Marc I. Gould, Van Nuys, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 26, 1978, Ser. No. 973,643
Int. Cl.² C22B *3/02*
U.S. Cl. 75—66 **9 Claims**

1. An apparatus for removing oxide impurities from a liquid alkali metal comprising:

a housing having top and bottom ends;

inlet means adjacent the top end of said housing for introducing a liquid alkali metal containing oxide impurities into said housing;

a conduit member located in said housing having a discharge end and a terminal end, said conduit member and said housing forming an annular flow path for said liquid alkali metal, said terminal end of said conduit member and said housing forming an annular flow path of gradually reduced cross-sectional flow area and terminating in a substantially increased cross-sectional flow area defined by said housing to provide a substantial change in the velocity head of liquid alkali metal flowing therethrough to form crystals of the oxide, said conduit having an interior portion defining an inner fluid passageway and at least the portion of said inner fluid passageway adjacent the terminal end of said conduit having a cross-sectional flow area sufficiently large to ensure that the flow of liquid alkali metal therethrough has a velocity of less than that which would carry entrained oxide crystals;

outlet means for the withdrawal of liquid alkali metal from the discharge end of said conduit; and

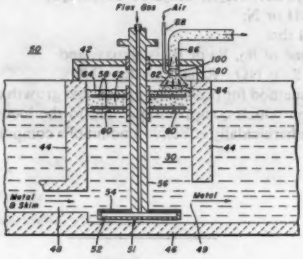
cooling means for cooling liquid alkali metal, passing through said annular passageway defined by said housing and said conduit, to a temperature within a desired range.

4,191,559

SKIM REMOVAL

Jan H. L. Van Linden, Allison Park; Ronald E. Miller, Murrysville, and Joseph R. Herrick, Verona, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 1, 1977, Ser. No. 856,339
Int. Cl.² C22B *21/06*
U.S. Cl. 75—68 R **13 Claims**



1. A method of removing the skim from molten aluminum and alloys thereof and simultaneously therewith reducing the amount of aluminum removed with the skim comprising the steps of:

(a) providing a body of molten aluminum containing skim;

(b) passing a gas therethrough to carry particles of skim to the surface of the molten aluminum;

(c) treating the skim on the surface of the molten aluminum to reduce the amount of aluminum contained therein and to provide said skim in a substantially powdery form, the treatment characterized by being adapted to permit aluminum trapped in the skim to return to said body; and

(d) removing a portion of the treated skim from the surface of the body of molten aluminum.

4,191,560

METHOD OF EXTRACTING A METAL FROM A MELT CONTAINING THE METAL

Peter A. Wright, Oxford, England, assignor to Gulf Chemical & Metallurgical Co., Texas City, Tex.

Filed Nov. 9, 1978, Ser. No. 959,018
Int. Cl.² C22B *25/00*
U.S. Cl. 75—85 **6 Claims**

1. A method of sulfidizing a metal in a melt of the metal comprising the steps of:

(a) mixing sulfur dioxide, air or oxygen, and a gaseous or liquid hydrocarbon in proportions so the gaseous reaction products of the mixture have a minimum temperature greater than the liquidus temperature of the melt or the liquidus temperature of the products of the reaction between the compounds of the melt and reaction products of the mixture, and so that the ratio of the partial pressure of

carbon dioxide to the partial pressure of carbon monoxide in the reaction products of the mixture falls within a range of 2.5:1 and 4.5:1; and

(b) injecting the mixture into the melt to react the mixture components to generate heat and form a sulfide of the metal.

4,191,561

METHOD FOR THE PRODUCTION OF TRIALUMINUM NICKELIDE FIBERS

Kenneth P. Quinlan, Newton, and Joseph J. Hutta, Groton, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 12, 1978, Ser. No. 968,874

Int. Cl.² C23F *1/02*

U.S. Cl. 75—101 R **2 Claims**

1. A process for separating trialuminum nickelide filaments from a solid, two-phase, composite matrix containing aluminum and trialuminum nickelide filaments which comprises the step of placing an ingot of the said aluminum composite into a leaching solution composed of 2 percent by weight oxalic acid and 0.09 percent by weight hydrogen chloride for a period of time sufficient to effect the separation of said trialuminum nickelide filaments from said matrix.

4,191,562

WEAR-RESISTANT NICKEL-BASE ALLOY

William L. Silence, Kokomo, Ind., assignor to Cabot Corporation, Kokomo, Ind.

Filed Jun. 19, 1978, Ser. No. 916,340

Int. Cl.² C22C *19/05*

U.S. Cl. 75—122 **6 Claims**

1. A wear-resistant alloy consisting essentially of, in weight percent, 2 to 3.5 carbon, 7 to 15 cobalt, 20 to 35 chromium, 20 to 30 iron, 5 to 16 molybdenum, up to 4.5 tungsten, 5.5 to 16 molybdenum plus tungsten, up to 1.5 silicon, up to 1 manganese and the balance nickel and incidental impurities.

4,191,563

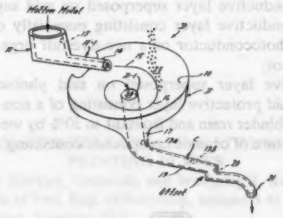
CONTINUOUS STREAM TREATMENT OF DUCTILE IRON

Herschel B. Smartt, and Bela V. Kovacs, both of Dearborn Heights, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 8, 1976, Ser. No. 665,019

Int. Cl.² C22C *33/08*

U.S. Cl. 75—130 R **4 Claims**



1. A method of producing a treated iron, comprising:

(a) forming a vortical flow of molten treatable grey iron, said molten iron entering said vortical flow at an outer peripheral zone thereof and exiting from said vortical flow at an inner zone thereof, said vortical flow being maintained at a rate of at least 12 lbs./sec.,

(b) introducing a predetermined and continuously graduated supply of metal treating agent into the outer upper peripheral zone of said vortical flow, said treating agent containing an effective amount of magnesium to nodulize said treatable iron, and

(c) maintaining said vortical flow in a closed chamber except for said entrance and exit, said entrance and exit being closed by said flow.

4,191,564

BRASS HAVING SUPERIOR ADHESION AND WEAR RESISTANT PROPERTIES

Yutaka Hirao, Toyama; Kunio Hata, Kurobe, and Masao Hosoda, Toyama, all of Japan, assignors to Chuetsu Metal Works Co., Ltd., Tokyo, Japan

Filed Jul. 13, 1978, Ser. No. 924,183

Claims priority, application Japan, Nov. 24, 1977, 52-140904

Int. Cl.² C22C *9/04*

U.S. Cl. 75—157.5 **5 Claims**

1. A brass having superior adhesion and wear resistant properties consisting essentially of, each by weight, 45% to 75% of copper, 2.0% to 7.0% of aluminum, 0.1% to 2.0% or iron, 1.0% to 5.0% of nickel, 0.5% to 2.0% of silicon, 0.1% to 2.0% of cobalt and the remainder zinc.

4,191,565

FLAME SPRAY POWDER MIX

Mahesh S. Patel, Albertson, N.Y., assignor to Eutectic Corporation, Flushing, N.Y.

Filed Jun. 15, 1978, Ser. No. 915,938

Int. Cl.² B22F *1/00*

U.S. Cl. 75—252 **9 Claims**

1. A flame spray powder mixture formed of agglomerates of a metal silicide mixed with a coating metal powder,

said metal silicide being at least one selected from the group consisting of disilicides of Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Co and boron silicide and magnesium, said silicide agglomerates being made of fine particles of said metal silicide of average size less than about 20 microns bound together in a matrix of a fugitive binder,

the average size of said agglomerates and said coating metal powder ranging from about 30 to 140 microns,

the composition of said powder mixture ranging from about 2% to 15% by weight of said silicide, with substantially the balance said coating metal powder.

4,191,566

ELECTROPHOTOGRAPHIC IMAGING PROCESS USING ANTHRAQUINOID BLACK PIGMENTS OR METAL COMPLEXES

Remy Jeanneret, Allschwil; Günther Zwahlen, Dornach; Christoph Frey, Aesch, and Georgios Zographos, Buchs, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

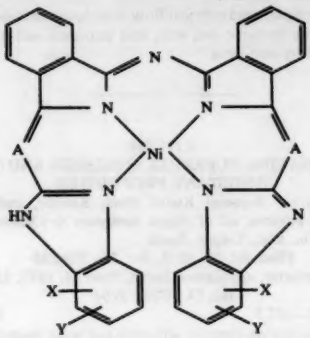
Filed Jan. 31, 1978, Ser. No. 873,818

Claims priority, application Switzerland, Feb. 7, 1977, 1456/77

Int. Cl.² G03G *13/056*

U.S. Cl. 430—37 **4 Claims**

1. An electrophotographic imaging process comprising the imagewise separation of electrically photosensitive particles by the combined action of an electric field and an imagewise irradiation with electromagnetic radiation, said particles being dispersed in an isolation medium, said particles containing a black pigment which is both chromophoric and electrically photosensitive, wherein the black pigment is selected from the metal complexes of the formula



wherein

A represents a nitrogen atom or the

group,

X represents a hydrogen or halogen atom or an alkyl group of 1 to 6 carbon atoms,

Y represents a hydrogen or halogen atom, an alkyl, alkoxy or alkylsulphonyl group of 1 to 6 carbon atoms, a nitro or carbamoyl group, an alkylcarbamoyl or alkoxycarbonyl group of 2 to 6 carbon atoms or an arylcarbamoyl or aryloxycarbonyl of 7 to 11 carbon atoms.

4,191,567

PROCEDURE FOR MAKING A REUSABLE PHOTOCONDUCTING CHARGE IMAGE CARRIER AND CHARGE IMAGE CARRIERS PREPARED BY THIS METHOD

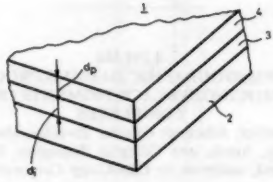
Hans Camenisch, Chur, and Jarmila Bachner, Egg, both of Switzerland, assignors to Elfotec A.G., Zumikon, Switzerland

Filed Feb. 3, 1975, Ser. No. 546,815

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1974, 2404919

Int. Cl.² G03G 5/04, 5/09, 5/08

U.S. Cl. 430—64 **12 Claims**



1. Procedure for preparing a repeatedly reusable photoconducting charge image carrier, comprising the steps of

(A) applying to a substrate (2) a first coat with at least one insulating, nonvolatile ingredient,

(B) heating the first coat in order to produce an insulating layer (3) on the substrate (2) said layer having a softening temperature,

(C) applying to the insulating layer (3) formed in step B, a second coat containing ZnO as photoconducting material and at least one binder for the ZnO, the photoconducting material being dispersed in a solution of said binder employing a solvent which will not dissolve the insulating layer (3),

(D) drying the second coat at a temperature below said softening temperature, and

(E) conditioning the resulting charge image carrier, whereby a charge image carrier usable for at least about 4000 cycles obtained.

12. Charge image carrier having an insulating layer (3) adhering to an electrically conducting substrate (2) and above the insulating layer (3), a photoconducting layer (4) containing ZnO as pigment, said carrier being made by the method comprising the steps of

(A) applying to a substrate (2) a first coat containing at least one insulating, nonvolatile ingredient,

(B) heating the first coat in order to produce an insulating layer (3) on the substrate (2), said layer having a softening temperature;

(C) applying to the insulating layer (3) formed in step B, a second coat containing said ZnO photoconducting material and at least one binder for the ZnO, the photoconducting material being dispersed in a solution of said binder employing a solvent which will not dissolve the insulating layer (3),

(D) drying the second coat at a temperature below said softening temperature, and

(E) conditioning the resulting charge image carrier whereby a charge image carrier (1) is obtained which can be charged and then discharged by exposure to light at least 4000 times.

4,191,568

PHOTOSENSITIVE MATERIAL FOR ELECTROPHOTOGRAPHY WITH DYE CONTAINING OVERLAYER

Hideaki Ema, Sagamihara; Satoshi Otomura, Chiba; Chikara Imai, and Kiyoshi Sakai, both of Tokyo, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Mar. 9, 1978, Ser. No. 884,836

Claims priority, application Japan, Mar. 15, 1977, 52-28260

Int. Cl.² G03G 5/14

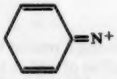
U.S. Cl. 430—66 **10 Claims**

1. An electrophotographic element, comprising:

an electrically conductive support;

a photoconductive layer superposed on said support, said photoconductive layer consisting essentially of an inorganic photoconductor or a non-dyestuff organic photoconductor;

a protective layer superposed on said photoconductive layer, said protective layer consisting of a non-photoconductive binder resin and from 0.1 to 30% by weight of one or a mixture of organic compounds containing the moiety



in the molecule, said protective layer having a thickness in the range of 0.5 to 5 μm and being thinner than said photoconductive layer, whereby said electrophotographic element exhibits a low residual electric potential after exposure to light and it retains a high proportion of an initial electric charge while it is maintained in the dark.

4,191,569

TREATING DEVELOPED LITHOPLATE WITH OLEOPHILIC COMPOSITION

Leslie E. Lawson, Kent, England, assignor to Vickers Limited, London, England

Filed Jul. 25, 1977, Ser. No. 818,572

Claims priority, application United Kingdom, Jul. 26, 1976, 31136/76

Int. Cl.[2] G03F 7/02; G03C 1/58, 5/22

U.S. Cl. 430—305 10 Claims

1. A method of processing a radiation sensitive plate comprising a substrate coated with a layer of a positive-working radiation sensitive material comprising a novolak resin sensitized with a diazonium salt or a quinone diazide, which method comprises:

(i) image-wise exposing the layer to actinic radiation using a continuous tone original in the absence of a half-tone screen,

(ii) developing the image-wise exposed layer to selectively remove the radiation-struck portions of the layer and reveal the substrate underlying these portions and desensitising the revealed substrate to render the same oleophobic,

(iii) drying the developed and desensitised plate,

(iv) coating the dried plate with a liquid composition comprising (a) an oleophilic film-forming material which is a liquid hydrocarbon solution of a normally solid material selected from the group consisting of solid hydrocarbons, solid fats, and mixtures thereof, wherein the liquid hydrocarbon constitutes from 60% to 95% by weight of the composition, and the normally solid material constitutes from 0.5 to 5% by weight of the composition, and (b) an organic solvent liquid constituting from 0.1 to 30% by weight of the composition which is capable of softening the surface of the non-radiation-struck portions,

(v) drying the coated plate to form an oleophilic layer on the non-radiation-struck portions and on said revealed substrate, and

(vi) washing the plate to remove the oleophilic layer from said revealed substrate.

4,191,570

PROCESS FOR HEAT TREATING LITHOGRAPHIC PRINTING PLATES

Hans-Peter Herting, Osterode, and Wolfgang J. Rebner, Herzberg, both of Fed. Rep. of Germany, assignors to Polychrome Corporation, Yonkers, N.Y.

Filed Oct. 10, 1978, Ser. No. 949,835

Int. Cl.[2] G03F 7/02

U.S. Cl. 430—302 10 Claims

1. A process for producing a lithographic printing plate comprising exposing and developing a light-sensitive printing plate; coating the exposed and developed surface of said plate with an aqueous solution of a compound selected from the group consisting of condensed aryl sulfonates or the metal salts thereof; drying said coating and then subjecting said treated plate to a burning-in without removal of said coating composition from said surface.

4,191,571

METHOD OF PATTERN FORMING IN A PHOTOSENSITIVE COMPOSITION HAVING A RECIPROCITY LAW FAILING PROPERTY

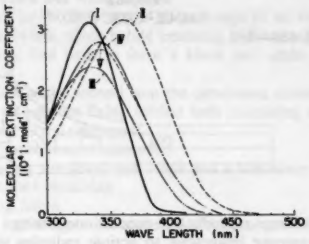
Saburo Nonogaki, Tokyo; Takahiro Kohashi, and Yoshio Hatano, both of Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 571,483, Apr. 24, 1975, abandoned. This application Feb. 7, 1977, Ser. No. 766,348

Claims priority, application Japan, Apr. 26, 1974, 49/46476; Jun. 28, 1974, 49/73328

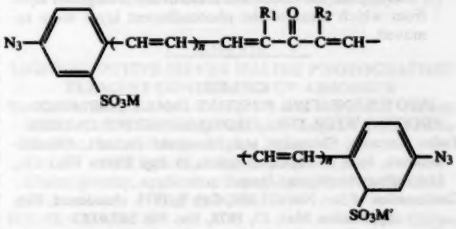
Int. Cl.[2] G03C 5/00, 1/68

U.S. Cl. 430—335 11 Claims



1. A process for forming a pattern which comprises the steps of:

(a) preparing a photoresist layer consisting essentially of at least one water-soluble polymer selected from the group consisting of poly-N-vinylpyrrolidone, copolymers of N-vinylpyrrolidone and acrylamide-diacetoneacrylamide copolymer and a water-soluble aromatic bisazide compound on a surface of a substrate for the desired pattern, said water-soluble aromatic bisazide compound being at least one compound represented by the following general formula:



wherein n is 1 or 0, R_1 represents a hydrogen atom or an alkyl group, R_2 represents a hydrogen atom or an alkyl group, R_1 and R_2 may be linked with each other at their terminals to form a cyclic ketone structure in the molecule, M represents an atom or atomic group capable of being converted to a cation in an aqueous solution, and M' represents an atom or atomic group capable of being converted to a cation in an aqueous solution, said photoresist layer consisting of 70 to 98% by weight of said water-soluble polymer and 2 to 30% by weight of said water-soluble aromatic bisazide compound based on the total amount of photoresist,

(b) applying light to said photoresist layer by passing the light through a mask having said pattern, in the presence of an oxygen containing gas and with the Schwarzschild's constant p being in the range of greater than 0 and smaller than 0.76, to harden the photoresist layer at a surface area substantially equal to or smaller than that of apertures of said mask through which beams pass, and

(c) developing the light-applied photoresist layer to form the pattern having a surface area substantially equal to or

smaller than that of apertures of said mask through which beams pass.

4,191,572

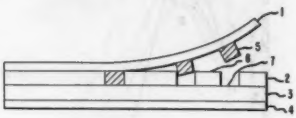
PROCESS FOR IMAGE REPRODUCTION USING MULTILAYER PHOTOSENSITIVE ELEMENT WITH SOLVENT-SOLUBLE LAYER

Abraham B. Cohen, Springfield, and Roxy Ni Fan, East Brunswick, both of N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 747,026, Dec. 2, 1976, abandoned, which is a continuation-in-part of Ser. No. 583,455, Jun. 3, 1975, abandoned. This application Jun. 12, 1978, Ser. No. 915,062

Int. Cl.² G03C *5/00*

U.S. Cl. 430—260 **19 Claims**



1. An image reproduction process comprising

(1) exposing imagewise to actinic radiation a peel apart photosensitive element consisting essentially of, in order, from top to bottom (a) a strippable cover sheet, (b) a photoadherent layer comprising material with ethylenically unsaturated or benzophenone type groups, (c) a nonphotosensitive solvent soluble, polymeric contiguous layer, and (d) optionally an auxiliary layer, and (e) a sheet support,

(2) stripping the cover sheet from the element with only the exposed or unexposed areas of the photoadherent layer adhered to the cover sheet while the other areas of said photoadherent layer remain on said contiguous layer without transfer to the cover sheet leaving an image of uncovered contiguous layer on the element, and

(3) washing out the uncovered areas of the contiguous layer from which areas of the photoadherent layer were removed.

4,191,573

PHOTOSENSITIVE POSITIVE IMAGE FORMING PROCESS WITH TWO PHOTO-SENSITIVE LAYERS

Tadao Toyama, Shizuoka, and Masayuki Iwasaki, Minami-ashigara, both of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 621,104, Oct. 9, 1975, abandoned. This application Mar. 17, 1978, Ser. No. 887,911

Claims priority, application Japan, Oct. 9, 1974, 49/116907

Int. Cl.² G03F *7/08*; G03C *1/54*

U.S. Cl. 430—166 **12 Claims**

1. A process for forming positive images which consists essentially of imagewise exposing to actinic light a photosensitive image forming element comprising:

a support;

a first photosensitive layer comprising an o-quinone diazide compound provided on said support; and

a second photosensitive layer which is substantially alkali insoluble directly overcoated on said first photosensitive layer, said second photosensitive layer being a homogeneous film rendered alkali-soluble upon exposure to actinic light and consisting essentially of in quantities sufficient to form an image upon development, as separate ingredients;

(i) an aryl azide compound having one or two aryl groups and at least one alkali-soluble group selected from the group consisting of a sulfonic acid group, a carboxylic acid group, and a hydroxyl group, and the alkali metal salts thereof in its molecular structure, and

(ii) a polyamide soluble in a lower alcohol, said polyamide and azide compound capable of co-acting to render areas exposed with actinic light alkali-soluble while unexposed area remain alkali-insoluble, and thereafter selectively dissolving said exposed areas in an alkaline medium.

4,191,574

PROCESS FOR FORMING A PHOTOGRAPHIC MAGENTA DYE IMAGE

Takaya Endo; Shui Sato; Shoji Kikuchi; Tamotsu Kozima; Tugumoto Usui; Hiroyuki Imamura, and Koichi Takabe, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

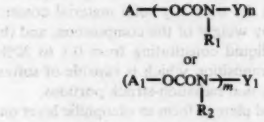
Continuation of Ser. No. 659,025, Feb. 18, 1976, abandoned. This application Aug. 2, 1978, Ser. No. 930,315

Claims priority, application Japan, Feb. 21, 1975, 50/21607

Int. Cl.² G03C *7/00, 1/40*

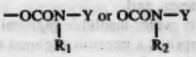
U.S. Cl. 430—387 **11 Claims**

1. A process for forming a photographic magenta dye image which comprises contacting exposed silver halide with a color developing agent in the presence of a 2-equivalent magenta coupler represented by the following formula:

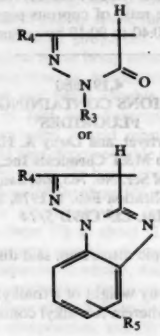


wherein R_1 and R_2 are individually hydrogen or a monovalent organic group selected from the class consisting of acyl and aliphatic hydrocarbon radicals which can have at least one substituent selected from the class consisting of halogen, nitro, cyano, aryl, alkoxy, aryloxycarboxy, alkoxycarbonyl, aryloxycarbonyl, sulfo, sulfamoyl, carbamoyl, acylamino, ureido, arylsulfonyloxy, oxo, alkyl, aryloxy, carboxy, alkylcarbamoyl, arylcarbamoyl, alkylsulfonamido, and arylsulfonamido; Y is a monovalent organic radical selected from the class consisting of an aromatic hydrocarbon residue, an aliphatic hydrocarbon residue, a heterocyclic residue, acyl, thioalkyl, and $-SO_2X$ wherein X is an aliphatic hydrocarbon residue, all of which can have at least one substituent selected from the class consisting of halogen, nitro, cyano, aryl, alkoxy, aryloxycarboxy, alkoxycarbonyl, aryloxycarbonyl, sulfo, sulfamoyl, carbamoyl, acylamino, ureido, arylsulfonyloxy, oxo, alkyl, aryloxy, carboxy, alkylcarbamoyl, arylcarbamoyl, alkylsulfonamido, and arylsulfonamido, the heterocyclic residue being selected from the class consisting of pyridyl, quinolyl, furyl, benzothiazolyl, oxazolyl, imidazolyl, and naphthoxazolyl; Y_1 is an m-valent organic radical selected from the class consisting of m-valent residues of an aliphatic hydrocarbon residue, an aromatic hydrocarbon residue and a heterocyclic residue, all of said residues can have at least one substituent selected from the class consisting of halogen, nitro, cyano, aryl, alkoxy, aryloxycarboxy, alkoxycarbonyl, aryloxycarbonyl, sulfo, sulfamoyl, carbamoyl, acylamino, ureido, arylsulfonyloxy, oxo, alkyl, aryloxy, carboxy, alkylcarbamoyl, arylcarbamoyl, alkylsulfonamido, and arylsulfonamido, the heterocyclic residue being selected from the group consisting of residues of pyridine, quinoline, furan, benzothiazoline, oxazoline, imidazoline and naphthoxazoline; and A and A_1 are respectively n-valent and

monovalent residues of a magenta coupler which are represented by the following formula when the split-off groups



are removed from the magenta couplers:



wherein R_3 is selected from the group consisting of hydrogen, alkenyl, alkyl, which contains up to 50 carbon atoms, a cycloalkyl group which can have at least one substituent selected from halogen, nitro, cyano, aryl, alkoxy, aryloxycarbonyl, alkoxycarbonyl, aryloxycarboxy, sulfo, sulfamoyl, carbamoyl, acylamino, ureido, heterocyclic, arylsulfonyloxy and oxo, aryl which can have at least one substituent selected from halogen, alkyl, alkoxy, aryloxy, carboxy, alkoxycarbonyl, acylamino, carbamoyl, alkylcarbamoyl, dialkylcarbamoyl, arylcarbamoyl, alkylsulfonamido, arylsulfonamido, cyano and nitro, a heterocyclic radical selected from the class consisting of pyridyl, quinolyl, furyl, benzothiazolyl, oxazolyl, imidazolyl and naphthoxazolyl wherein said radicals can have at least one substituent selected from the class consisting of halogen, alkyl, alkoxy, aryloxy, carboxy, alkoxycarbonyl, acylamino, carbamoyl, alkylcarbamoyl, dialkylcarbamoyl, arylcarbamoyl, alkylsulfonamido, arylsulfonamido, cyano and nitro, carbamoyl and thiocarbamoyl; R_4 is alkyl having up to 50 carbon atoms which can have at least one substituent selected from halogen, nitro, cyano, aryl, alkoxy, aryloxycarbonyl, alkoxycarbonyl, aryloxycarboxy, sulfo, sulfamoyl, carbamoyl, acylamino, ureido, heterocyclic, arylsulfonyloxy and oxo, aryl which can have at least one substituent selected from halogen, alkyl, alkoxy, aryloxy, carboxy, alkoxycarbonyl, acylamino, carbamoyl, alkylcarbamoyl, dialkylcarbamoyl, arylcarbamoyl, alkylsulfonamido, arylsulfonamido, cyano and nitro, a heterocyclic radical selected from the class consisting of pyridyl, quinolyl, furyl, benzothiazolyl, oxazolyl, imidazolyl and naphthoxazolyl wherein said radicals can have at least one substituent selected from the class consisting of halogen, alkyl, alkoxy, aryloxy, carboxy, alkoxycarbonyl, acylamino, carbamoyl, alkylcarbamoyl, dialkylcarbamoyl, arylcarbamoyl, alkylsulfonamido, arylsulfonamido, cyano and nitro, alkoxycarbonyl, aryloxycarbonyl, aralyloxycarbonyl, an alkylthio group, an arylthio group, an alkoxy group, an aryloxy group, an alkylthio group, an arylthio group, an amino group, a carboxy group, an amido radical, an N-alkylacylamino radical, an N-arylacylamino radical, an ureido radical, a thioureido radical, a quanidino radical a piperidino radical or a pyroridino radical; and R_5 is one to four monovalent radicals selected from a hydrogen atom, a halogen atom, an alkyl radical, an alkoxy radical, an amido radical, a carbamoyl radical and a sulfamoyl radical, and m and n are individually a positive integer.

4,191,575

TWO-STEP PHOTOGRAPHIC PROCESSING OF BLACK AND WHITE IMAGES WHICH ENHANCES THE IMAGES BY CONTROLLED BLEACHING DURING FIXING IMMEDIATELY FOLLOWING DEVELOPMENT AND WHICH PRODUCES BLACK AND WHITE IMAGES WITH REDUCED DENSITY IN LOW DENSITY AREAS

Donald J. Sykes, Upper Saddle River, and Louis D. Pratt, North Bergen, both of N.J., assignors to Philip A. Hunt Chemical Corp., Palisades Park, N.J.

Continuation of Ser. No. 312,828, Dec. 7, 1972, abandoned. This application Aug. 3, 1976, Ser. No. 711,139

Int. Cl.[2] G03C *5/32, 5/30*

U.S. Cl. 430—418 **8 Claims**

1. A two-step method of photographic processing for non-lithographic black and white images

(I) in which as the first step a latent image in an exposed black and white silver halide emulsion is developed in a developing first bath to form a black and white silver image and

(II) in which as the second step the developed emulsion is fixed in an aqueous fixing second bath containing a thiosulfate salt as a fixing agent,

wherein the improvement comprises

(III) enhancing the developed black and white silver image by controlled bleaching

(a) during fixing

(i) by including in the second bath an amount of a chelated salt

(1) of a metal having plural valance states selected from the group consisting of iron and cobalt,

(2) with a chelating acid selected from the group consisting of aminopolycarboxylic acids, polyaminocarboxylic acids and phosphonic acids,

(3) the metal being in its higher valance state,

(ii) sufficient to greatly reduce the silver in low density areas of the developed black and white silver image

(iii) while not substantially affecting areas of heavier density,

(iv) and also including in the second bath an agent for accelerating bleaching said agent being selected from the group consisting of thiourea, substituted thioureas, cyclic thioureas and polyethylene glycol.

4,191,576

LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC ELEMENT CONTAINING UV ABSORBER

Yoshiharu Fuseya; Atsuo Inoue; Hiroshi Hara, and Tadashi Ikeda, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

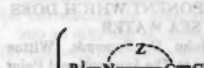
Filed Apr. 26, 1978, Ser. No. 900,376

Claims priority, application Japan, Apr. 27, 1977, 52-48953

Int. Cl.[2] G03C *1/84*

U.S. Cl. 430—512 V **40 Claims**

1. A light-sensitive silver halide photographic element comprising a support having thereon at least one light-sensitive silver halide emulsion layer, wherein said silver halide photographic element comprises, in at least one layer coated thereon, which may be said light-sensitive emulsion layer, at least one water-insoluble compound represented by the following general formula (I):



(I)

wherein Z represents the atoms necessary to complete an oxazolidine ringe, a pyrrolidine ring or a thiazolidine ring; R^1 and R^2, which may be the same or different, each represents an alkyl group or an aryl group; R^3 represents a —COR^4 group or a —CO_2R^5 group; R^4 represents an alkyl group or an aryl group; R^5 represents a hydrogen atom, an alkyl group or an

aryl group; and n is 1 or 2 and when n is 2, at least one of R^1, R^4 and R^5 represents a divalent alkylene group, a divalent arylene group or a divalent group of alkylene and arylene moieties to form a dimer, wherein if the photographic element is a positive film or layer the at least one compound of general formula I(I) is present in an amount of about 50 to about 1,500 mg/m^2 and

if the photographic element is a negative film the at least one compound of general formula (I) is present in an amount of about 5 to about 650 mg/m^2.

4,191,577

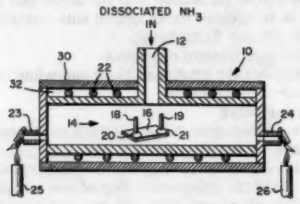
BRAZING SLURRY

William E. Buescher, Seneca Falls, N.Y.; Frederick J. Roberto, Emporium, and Isabelle M. Sobierajski, St. Marys, both of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Oct. 26, 1978, Ser. No. 955,088

Int. Cl.[2] C23C *1/12*; B23K *35/34*

U.S. Cl. 106—1.12 **4 Claims**



1. A brazing composition comprising, by weight, a substantially homogeneous suspension of about 21–22% fine particle metallic tungsten; about 7–8% calcium oxide; about 5–6% silicon dioxide; about 5–6% titanium dioxide; about 3–4% aluminum oxide; and about 55.5–57.5% of an organic binder.

4,191,578

RELEASE AGENTS

Donald S. Carter, Indianapolis, Ind., assignor to Gene Conreaux & Co., Inc., Indianapolis, Ind.

Filed Nov. 2, 1977, Ser. No. 847,829

Int. Cl.[2] B28B *7/36*

U.S. Cl. 106—1.13 **15 Claims**

1. A release agent used to separate patterns and core boxes from foundry molds and cores consisting essentially of a comminuted material selected from the group consisting of aluminum, copper, brass, bronze, graphite, talc and mica, or mixtures thereof, a non-thermosetting organosiloxane polymer fluid to promote adherence of the comminuted material to a pattern or core box, and a solvent vehicle from the group consisting of non-propellant grade chlorocarbon of fluorocarbon solvents which is substantially non-reactive with the comminuted material.

4,191,579

ANTIFOULING PAINT COMPRISING A COPOLYMER CONTAINING ORGANO TIN SALT AND A PIGMENT HAVING A COMPONENT WHICH REACTS WITH SEA WATER AND ANOTHER COMPONENT WHICH DOES NOT REACT WITH SEA WATER

George Hails, Whickham, and John D. Symonds, Witton Gilbert, both of England, assignors to The International Paint Company Limited, London, England

Filed Oct. 12, 1977, Ser. No. 841,535

Claims priority, application United Kingdom, Oct. 18, 1976, 43172/76

Int. Cl.[2] C08L *33/02*

U.S. Cl. 106—15 R **8 Claims**

1. An anti-fouling paint for ships' hulls comprising:

(a) a film-forming copolymer containing 55 to 70 percent by weight of units of at least one triorgano tin salt of an olefinically unsaturated carboxylic acid, the balance of the copolymer being units of at least one olefinically unsaturated comonomer, and

(b) a substantially water-insoluble pigment component, part of which comprises a cuprous pigment selected from the group consisting of cuprous thiocyanate and cuprous oxide capable of reacting with sea water to form a water-soluble metal compound and part of which comprises an unreactive pigment which does not react with or dissolve in sea water, the ratio of cuprous pigment to unreactive pigment being 60:40 to 90:10 by volume.

4,191,580

STABLE DISPERSIONS CONTAINING TRIALKYLTIN FLUORIDES

Charles B. Beiter, Carteret, and Leroy A. Hafner, Edison, both of N.J., assignors to M&T Chemicals Inc., Woodbridge, N.J.

Continuation-in-part of Ser. No. 763,406, Jan. 28, 1977, Pat. No. 4,153,574. This application Feb. 1, 1978, Ser. No. 874,232

Int. Cl.[2] C09D *5/14*

U.S. Cl. 106—16 **8 Claims**

1. A stable thixotropic dispersion, said dispersion consisting essentially of:

(a) from 40 to 70% by weight of a trialkyltin fluoride of the formula R_3SnF wherein R is alkyl containing from 2 to 12 carbon atoms;

(b) from 20 to 60% by weight of at least one organic liquid having a kauri butanol value of 96 or less and selected from the group consisting of alcohols containing from 4 to 12 carbon atoms, aliphatic hydrocarbons containing from 5 to 12 carbon atoms and aromatic hydrocarbons;

(c) from 0.5 to 10% by weight of a compound selected from the group consisting of:

(1) the lithium and sodium salts of p-toluenesulfonic acid and phenylphosphonic acid,

(2) nitric acid salts of calcium, magnesium, sodium, lithium, iron and zinc,

(3) salts of p-toluenesulfonic or phenylphosphonic acid and an element selected from the group consisting of magnesium, calcium, strontium and barium,

(4) the chlorides of metallic elements selected from the group consisting of divalent tin, divalent copper, silver, gold and the elements in groups II-A, II-B, IV-B, V-A, VI-B, VII-B and VIII of the periodic table and

(5) carboxylic acid salts of lead, manganese(ous), zirconium, barium and strontium, wherein said carboxylic acid is selected from the group consisting of acetic, propionic, butyric, hexoic, heptanoic, cyclohexanecarboxylic and benzoic acids.

6. A coating composition for inhibiting the attachment and growth of fouling organisms, said composition consisting essentially of from 1.0 to 20.0% by weight of the trialkyltin fluoride containing dispersion as described in claim 1, from 10 to 50% by weight of at least one pigment, from 10 to 50% by weight of at least one film-forming material selected from the group consisting of vinyl chloride homopolymers and copolymers, rosin and chlorinated synthetic rubbers, from 20 to 60% by weight of at least one organic solvent and from 0 to 5% by weight of a bentonite clay.

4,191,581

AQUEOUS-ALCOHOLIC, FOAM-GROWTH-CONTROLLING PRINTING INK COMPOSITIONS

Artimus C. Hamilton, Wilmington, Del., assignor to Congoleum Corporation, Kearny, N.J.

Division of Ser. No. 685,868, May 12, 1976. This application Jul. 7, 1977, Ser. No. 813,782

Int. Cl.[2] C09D *11/00*

U.S. Cl. 106—20 **8 Claims**

1. An aqueous-alcoholic, foam-growth-controlling printing

ink composition having a pH of from about 8 to about 12 of use in the chemical embossing of heat-foamable and expandable resinous materials, said aqueous-alcoholic, foam-growth-controlling printing ink composition being capable of being applied to the surface of a substrate comprising gelled, heat-foamable and expandable resinous materials containing a heat decomposable foaming or blowing agent comprising:

(1) from about 1% to about 15% of a foam-growth-controlling chemical agent which is soluble or dispersible in said aqueous-alcoholic, foam-growth-controlling printing ink composition and sufficiently stable therein as to retain its foam-growth-controlling properties, said foam-growth-controlling chemical agent being selected from the group consisting of benzotriazole, aminotriazoles, and mixtures of such triazoles and being capable of controlling the decomposition of said heat-decomposable foaming or blowing agent included in said substrate to which it is applied when said heat-decomposable foaming or blowing agent is raised to normally heat-decomposable temperatures; (2) from about 1% to about 9% of a water-soluble or water-dispersible alcohol having from 1 to 6 carbon atoms; (3) from about 1% to about 11% of a pH controlling or buffering agent capable of creating or maintaining the pH of said aqueous-alcoholic, foam-growth-controlling printing ink composition in the range of from about 8 to about 12; (4) from about 30% to about 75% of an aqueous printing ink composition; and (5) from about 10% to about 40% of added water, all percentages being by weight.

4,191,582

COMPOSITION CONTAINING POLYMERIC ALKOXYSILANE AND REFRACTORY MATERIAL AND METHOD FOR PREPARING A MOLD BASED THEREON

Walter L. Magee, Jr., Danbury, Conn., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 786,720, Apr. 11, 1978, abandoned, which is a division of Ser. No. 756,310, Jan. 3, 1977, Pat. No. 4,042,612. This application Aug. 21, 1978, Ser. No. 935,449

Int. Cl.² B28B 7/34

U.S. Cl. 106—38.2 **12 Claims**

1. In the preparation of a mold from a refractory material and a binder by admixing comminuted refractory material and a binder with a solvent and then applying the resulting mixture to a pattern and allowing it to set, the improvement which comprises using as said binder a polymeric alkoxysilane having the average formula:

$$Si(OR)_a\left(O-\overset{\overset{O}{\|}}{\underset{\underset{O}{\|}}{S}}-R^1\right)_bO_{\frac{4-a-b}{2}}$$

wherein each R is an independently selected hydrocarbon radical or hydrocarbon ether radical free of aliphatic unsaturation, each R^1 is an independently selected hydrocarbon radical free of aliphatic unsaturation, a has a value from 1 to 3 and b has a value from 0.0001 to 1.0.

7. A composition comprising a refractory material and a polymeric alkoxysilane having the average formula

$$Si(OR)_a\left(O-\overset{\overset{O}{\|}}{\underset{\underset{O}{\|}}{S}}-R^1\right)_bO_{\frac{4-a-b}{2}}$$

where each R is an independently selected hydrocarbon radical or hydrocarbon ether radical free of aliphatic unsaturation, each R^1 is an independently selected hydrocarbon radical free of aliphatic unsaturation, a has a value from 1 to 3 and b has a value from 0.0001 to 1.0.

4,191,583

MANGANESE CORDIERITE GLASS-CERAMICS

William H. Armistead, and Irwin M. Lachman, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 899,369, Apr. 24, 1978, abandoned. This application Sep. 22, 1978, Ser. No. 944,856

Int. Cl.² C03C 3/22

U.S. Cl. 106—39.6 **3 Claims**

1. An impervious sintered glass-ceramic product having a cordierite crystal structure and a composition within the range 1.7–2.4 RO.1.9–2.4 Al_2O_3.4.5–5.2 SiO_2 wherein RO comprises from 10–75 mole percent MgO and from 25–90 mole percent MnO.

4,191,584

CEMENTITIOUS COMPOSITIONS

David Berry, Hull, England, assignor to BP Chemicals Limited, London, England

Filed Apr. 27, 1978, Ser. No. 900,754

Claims priority, application United Kingdom, May 17, 1977, 20676/77

Int. Cl.² C04B 7/35

U.S. Cl. 106—90 **7 Claims**

1. A cementitious composition comprising a cement mix and an aqueous solution of a calcium polyformate in which the molar ratio of calcium cation to the formate anion is between 1:3 and 1:8.

4,191,585

ALKALI RESISTANT GLASS ARTICLE AND METHOD OF PREPARATION

Karlis L. Jaunarajs, Littleton, Colo., assignor to Johns-Manville Corporation, Denver, Colo.

Filed Jun. 26, 1978, Ser. No. 918,976

Int. Cl.² C04B 31/06

U.S. Cl. 106—99 **20 Claims**

1. A glass fiber article having enhanced alkali resistance which comprises glass fiber coated with zinc stearate, said zinc stearate being present in an amount of from 1 to 50 percent by weight of coated fiber.

4,191,586

METHOD AND APPARATUS FOR REDUCING THE CALORIFIC CONSUMPTION OF A CEMENT PRODUCING PLANT

Francis Dambrine, Marcq en Baroeul, France, assignor to Fives-Cail Babcock, Paris, France

Continuation-in-part of Ser. No. 735,426, Oct. 26, 1976, abandoned. This application Apr. 21, 1978, Ser. No. 898,549

Claims priority, application France, Oct. 23, 1975, 75 32484

Int. Cl.² C04B 7/40

U.S. Cl. 106—100 **3 Claims**

1. A method of reducing the calorific consumption of an installation for producing cement from dry raw material in a rotary tubular kiln, comprising the steps of

(a) heating the raw material in the kiln by hot gases therein to convert the raw material in to a clinker product,

(b) recovering the hot gases from the kiln,

(c) preheating a major portion of the raw material by the recovered hot gases,

(d) introducing the preheated major raw material portion into an inlet end of the kiln for heating in the kiln,

(e) removing the clinker product from a discharge end of the kiln,

(f) delivering fresh air to the removed clinker product to cool the same whereby the fresh air is heated by contact with the clinker product,

(g) removing a portion of the heated fresh air at a temperature of the order of 900° C. to 1000° C.

(h) bringing the removed portion of the fresh air heated to said temperature into contact with a minor fraction of the raw material whereby said heated fresh air portion is

cooled in heat exchange with the minor raw material fraction and the minor raw material fraction is heated and at least partially calcined,

(i) introducing the at least partially calcined minor raw material fraction into the kiln, and

(j) delivering at least a portion of said cooled air with the fresh air to the clinker product removed from the kiln.

4,191,587

PREPARATION OF HYDROPHOBIC SILICON DIOXIDE

Günter Kratel; Günter Stohr, both of Durach, and Hans Katzer, Munich, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 30, 1978, Ser. No. 965,537

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1977, 2754484

Int. Cl.[2] C09C *3/12*; C04B *31/44*

U.S. Cl. 106—308 Q **2 Claims**

1. A process for the preparation of hydrophobic silicon dioxide which comprises treating silicon dioxide having a surface area of at least 50 m^2/g with at least one organosilicon compound having from 2 to 4 silicon atoms per molecule, in which at least 2 hydrocarbon radicals are bonded to each silicon atom and the silicon valences which are not satisfied by hydrocarbon radicals are satisfied by siloxane oxygen atoms, and at least on tin compound having radicals selected from the group consisting of Sn-bonded halogen, Sn-bonded organic radicals and mixtures thereof.

4,191,588

METHOD OF CLEANING FOULED HEAT EXCHANGERS AND OTHER EQUIPMENT

Donald A. Keyworth, Houston, and Jerome R. Sudduth, Pasadena, both of Tex., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Mar. 2, 1979, Ser. No. 16,855

Int. Cl.[2] B08B *3/08*

U.S. Cl. 134—2 **10 Claims**

1. The process for cleaning heat exchangers and other processing equipment whose surfaces have become fouled with sludge deposits that contain a major amount of cuprous halide that comprises contacting the portions of the equipment that contain said sludge deposits with a cleaning solution that contains from 5% to 35% by weight of an alkyl aluminum halide selected from the group consisting of alkyl aluminum dihalides of the formula $AlRX_2$ and alkyl aluminum sesquihalides of the formula $R_3Al_2X_3$, wherein R is alkyl having 1 to 6 carbon atoms and X is chlorine, bromine, or fluorine, in a hydrocarbon solvent at a temperature in the range of 0° C. to 50° C. until substantially all of the deposited sludge has been loosened or removed and washing said portions of the equipment with a hydrocarbon solvent at a temperature in the range of 10° C. to 70° C. to remove loosened sludge and residual cleaning solution.

4,191,589

METHOD AND APPARATUS FOR CLEANING CARPETS AND SURFACES USING CLEANING FLUID

Kenneth F. Halls, and Robert R. Gibbons, both of Denver, Colo., assignors to The John J. Sundheim Family Estate, Englewood, Colo., a part interest

Filed Apr. 25, 1977, Ser. No. 790,592

Int. Cl.[2] B08B *5/04*

U.S. Cl. 134—21 **2 Claims**

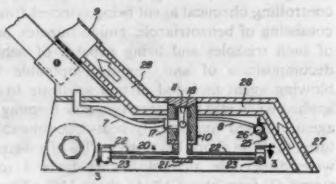
1. A method for cleaning hard and soft surfaces such as carpets, floors, streets, and the like by using three high velocity streams of cleaning fluid from a source under high pressure, said method comprising the steps of:

(a) placing the source of cleaning fluid under high pressure of about 200 to about 1,200 pounds per square inch,

(b) forming three high velocity streams of about 150 to about 400 feet per second of cleaning fluid by exposing said high pressure source of cleaning fluid to ambient pressure through three nozzle means;

(c) mounting each of said three nozzle means for rotation about an axis substantially perpendicular to the surface to be cleaned and at a distance from said respective axis,

(d) directing two of said nozzle means toward the surface to be cleaned at an inclined angle to said surface whereby said cleaning fluid under high pressure from said source issues in at least one stream from each of said two of said nozzle means toward said surface at an inclined angle thereto creating respective reaction forces on each of said



two of said nozzle means which propel said three nozzle means about the respective axis of rotation in a first rotational direction at a high velocity relative to said surface,

(e) directing the third of said nozzle means toward said surface at an inclined angle thereto in a direction creating reaction forces generally opposite to and substantially less than the combined reaction forces of said two of said nozzle means to effect a superior cleaning action,

(f) moving the axis of rotation of each respective nozzle means relative to said surface, and,

(g) subjecting the surface to be cleaned to pressure less than ambient.

4,191,590

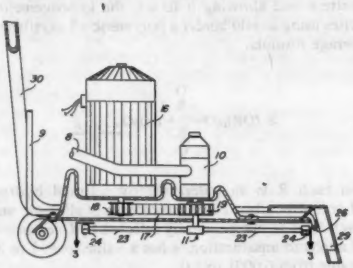
METHOD AND APPARATUS FOR CLEANING CARPETS AND SURFACES USING CLEANING FLUID

John J. Sundheim, Englewood, Colo., assignor to The John J. Sundheim Family Estate, Englewood, Colo.

Filed Apr. 25, 1977, Ser. No. 790,593

Int. Cl.[2] B08B *5/04*

U.S. Cl. 134—21 **31 Claims**



1. A method for cleaning hard and soft surfaces such as carpets, floors, streets, and the like by using a plurality of high velocity streams of cleaning fluid from a source under high pressure, the method comprising the steps of:

(a) forming a plurality of high velocity streams of cleaning fluid by exposing said source of cleaning fluid under high pressure to ambient pressure through a plurality of nozzle means,

(b) mounting each of said plurality of nozzle means for rotation about an axis substantially perpendicular to the surface to be cleaned,

(c) directing each of said high velocity streams of cleaning fluid through the respective nozzle means against the

surface to be cleaned at an inclined angle to said surface, and

(d) utilizing power means to move the nozzle means of each and every respective high velocity stream of cleaning fluid at a high angular velocity about said axis of rotation in a direction so that the velocity imparted to each respective stream of cleaning fluid by the respective moving of the nozzle means adds to the existing velocity to effect increased cleaning efficiency of the respective directed stream of step c.

16. A method for cleaning hard and soft surfaces such as carpets, floors, streets, concrete surfaces, tennis courts, and the like by using at least two high velocity streams of cleaning fluid from a source under pressure, said method comprising the steps of:

(a) placing the source of cleaning fluid under high pressure,

(b) forming at least two high velocity streams of cleaning fluid with different flow rates by exposing said source of cleaning fluid under high pressure to ambient pressure through at least two different openings located at least two distinct locations from an axis, said axis being substantially perpendicular to said surface, each of said high velocity streams having a head portion where the cleaning fluid under high pressure from the source meets ambient pressure at the respective opening,

(c) directing each of said high velocity streams of cleaning fluid against the surface to be cleaned at an inclined angle to said surface, each of said streams being directed against different areas of the surface, the area against which said stream with the greater flow rate is directed being spaced farther from said axis than the area against which the stream with the lesser flow rate is directed,

(d) moving the head portion of each high velocity stream of cleaning fluid at a high annular velocity about said axis, and,

(e) moving the axis of rotation relative to the surface to be cleaned whereby a section of the surface to be cleaned is first struck with a first amount of fluid from the stream with the greater flow rate, a lesser amount of fluid from the stream with the lesser flow rate, and then a third amount of fluid from the stream with the greater flow rate, said first and third amounts being equal.

4,191,591
METHOD AND APPARATUS FOR CLEANING A MATRIX OF A MAGNETIC SEPARATOR

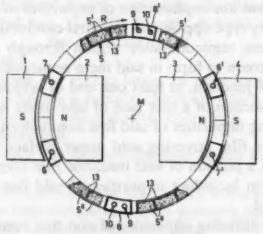
Hans Bender, Leverkusen; Georg Schnabel, Hürth-Fischenich; Gottfried Düren, Cologne, and Wolf Zabel, Seelscheid, all of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz, Fed. Rep. of Germany

Continuation of Ser. No. 848,645, Nov. 4, 1977, abandoned. This application Dec. 20, 1978, Ser. No. 971,644

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1976, 2650925

Int. Cl.² B08B *7/04*; B03C *1/00*

U.S. Cl. 134—25 R **10 Claims**



1. A method for cleaning of magnetic material retained by a ferromagnetic matrix of a magnetic separator comprising the steps of cleaning the matrix to wash free the magnetic material in a high pressure rinse, said cleaning including the steps of first introducing a liquid medium into a cleaning chamber and then separately introducing at a later time a compressed gaseous medium under high pressure and without prior mixing with the liquid medium directly into the cleaning chamber lying in sealed relationship directly above the matrix such that the liquid passing downwardly through the matrix receives additional kinetic energy as a result of the introduction of the high pressure gaseous medium.

4,191,592
GLASSWASHER

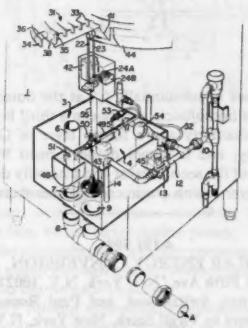
William A. Hansen, 95 Ashland Ave., Winnipeg, Manitoba, and William A. Conly, 720 Vaughn Ave., Selkirk, Manitoba, both of Canada

Filed Jan. 11, 1979, Ser. No. 2,865

Claims priority, application Canada, Jan. 20, 1978, 295366

Int. Cl.² B08B *3/02, 9/08*

U.S. Cl. 134—48 **3 Claims**



1. A glasswashing machine having a glass washing section and a glass rinsing section; a wash tank and a rinse tank communicating with a drain; a washing spray assembly located above said wash tank and a rinsing spray assembly located above the rinse tank; rotatable glass conveyor means located above said assemblies, said conveyor means including driven gear means adapted, when said conveyor means has rotated a predetermined amount, to permit the rinse tank to empty to a predetermined level and then to be refilled with clean water simultaneously with the addition of a sanitizer, said driven gear means being rotatable and including a perimeter gear located beneath said conveyor means, a drive gear meshing with said perimeter gear, first and second radially spaced trip levers depending from said conveyor means and each engagable with an associated plunger adapted to activate an associated microswitch and solenoid.

4,191,593
DOUBLE HETEROJUNCTION SOLAR CELLS

Jean A. Cacheux, Castanet-Tolosan, France, assignor to Centre National d'Etudes Spatiales, Paris, France

Filed Sep. 26, 1978, Ser. No. 946,084

Claims priority, application France, Sep. 27, 1977, 77 28984

Int. Cl.² H01L *31/06*

U.S. Cl. 136—89 CA **2 Claims**

1. A photovoltaic cell device comprising:

a metal parallelepipedal unit;

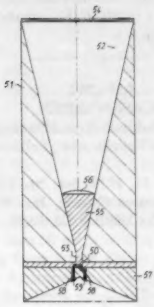
a tapering cavity inside said unit having a base coinciding with the upper end of the unit and an apex communicating with the lower end of the unit through a hole;

a Fresnel lens on the base of the cavity;

a transparent antireflecting insert member within said hole and the part of the cavity near the apex thereof, said insert

member being terminated at its upper end by a lens shaped part; and

against said hole a photovoltaic cell comprising a heterojunction between a first layer of $Ga_{1-x}Al_xAs$ of p-type conductivity and a second layer of GaAs of n-type conductivity, x varying from 0 at the junction of the first and



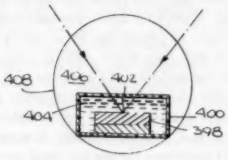
second layers to substantially 0.9 at the outer face of the first layer; a homojunction between a third layer of Ge of p-type conductivity and a fourth layer of Ge of n-type conductivity; and a tunnel diode formed by a heavily doped part of the second layer and a heavily doped part of the third layer which are in contact therebetween.

4,191,594

SOLAR ENERGY CONVERSION

Virgil Stark, 936 Fifth Ave., New York, N.Y. 10021; Alexandre Vayda, Lausanne, Switzerland, and Paul Rousset, Cannes, France, assignors to Virgil Stark, New York, N.Y.

Division of Ser. No. 746,065, Nov. 30, 1976, Pat. No. 4,134,393.
This application Dec. 30, 1977, Ser. No. 866,068
Claims priority, application France, Jul. 9, 1976, 76 20986; Oct. 8, 1976, 76 30248
Int. Cl.[2] H01L 31/04
U.S. Cl. 136—89 PC **14 Claims**



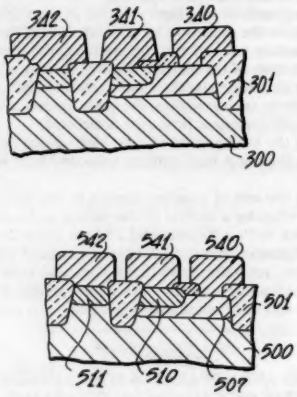
1. Apparatus for converting solar energy to electrical energy cmprising elongated collector means including an inner elongated conduit adapted to pass a fluid therethrough and an outer elongated conduit adapted to pass a fluid therethrough enclosing said inner conduit, said outer and inner conduits having substantially parallel axes and said outer and inner conduits being transparent at least in part with the transparent parts of said outer and inner conduits being in alignment, said apparatus further comprising elongated lens means having an axis extending substantially parallel to said axes of said outer and inner conduits and having an elongated focus in which the solar energy may be concentrated, said lens means and said outer and inner conduits being positioned so that the elongated focus of said lens means is adapted to extend substantially within and substantially along the length of said inner conduit, and photoelectric means disposed in said inner conduit in a heat exchanging relationship with the fluid adapted to be passed through said inner conduit, said photoelectric means being in alignment with the transparent parts of said outer and inner conduits and being adapted to receive concentrated solar energy passing through the transparent parts of said outer and inner conduits.

4,191,595

METHOD OF MANUFACTURING PN JUNCTIONS IN A SEMICONDUCTOR REGION TO REACH AN ISOLATION LAYER WITHOUT EXPOSING THE SEMICONDUCTOR REGION SURFACE

Kunio Aomura; Fujiki Tokuyoshi, and Masahiko Nakamae, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Sep. 21, 1977, Ser. No. 835,328
Claims priority, application Japan, Sep. 22, 1976, 51/114052
Int. Cl.[2] H01L 29/72, 21/225
U.S. Cl. 148—1.5 **6 Claims**



1. A method of manufacturing a semiconductor device, comprising the steps of,

preparing a semiconductor substrate of a first conductivity type,

forming an oxide layer in said substrate, thereby forming a mesa semiconductor region in said substrate defined by said oxide layer,

forming an insulator film of a uniform thickness on the upper surface of said mesa semiconductor region,

carrying out ion implantation of impurities of a second conductivity type opposite to said first conductivity type, into said mesa semiconductor region through said insulator film thereon to form in said mesa semiconductor region a first PN junction, at least one end of which terminates at a first portion of a side face of said oxide layer,

introducing impurities of said first conductivity type into an insulator film covering said upper surface to selectively convert a portion of said insulator film completely into a glass film including impurities of said first conductivity type and

thermally diffusing impurities of said first conductivity type from said glass film into said mesa semiconductor region to form a second PN junction of a depth shallower than that of said first PN junction, at least one end of said second PN junction terminating at a second portion of said side face directly over said first portion.

4,191,596
METHOD AND COMPOSITIONS FOR COATING ALUMINUM

David Y. Dollman, Doylestown, and Timothy J. O'Grady, Ambler, both of Pa., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sep. 6, 1978, Ser. No. 939,983
Int. Cl.² C23F 7/00; B44D 1/36
U.S. Cl. 148—6.27 **10 Claims**

1. An aqueous acidic solution for coating the surface of a metal selected from the group consisting of aluminum and alloys thereof in which aluminum is the principal ingredient, which consists essentially of:

(i) from about 0.5 to about 10 grams/liter of at least one polymer selected from the group consisting of polyacrylic acid and esters thereof, and

(ii) from about 0.2 to about 8 grams/liter of at least one acid selected from the group consisting of H_2ZrF_6, H_2TiF_6 and H_2SiF_6,

the pH of the solution being less than about 3.5.

4,191,597
HEAT TREATMENT FOR MARTENSITE CURED ALLOYS

Ralf Krumphold, Dresden; Heinrich Paul, Pappritz, both of Fed. Rep. of Germany; Juri Busalow, and Iwan Kopjew, both of Moscow, U.S.S.R., assignors to Akademie der Wissenschaften der DDR, Berlin-Adlershof, Fed. Rep. of Germany and Akademie der Wissenschaften der UdSSR, Moscow, U.S.S.R.

Filed Dec. 22, 1978, Ser. No. 973,074
Int. Cl.² C21D 9/52
U.S. Cl. 148—12 B **4 Claims**

1. A process for improving the mechanical properties of martensite-cured alloys, comprising the steps of

subjecting the alloys to a cold deformation with the deformation degree greater than 30%;

thereafter subjecting the alloys to a heat treatment, wherein the following conditions must be met over the total cross-section of the portion of the alloy within the heating zone:

$$\Delta T/\Delta t = 0.9\ Tgl/t_A \geqq 50°\ C./sec, \quad (1)$$

(2) 20 sec > tgl > 0.1 sec, and

(3) $tgl = t_G - t_A$, where

$\Delta T/\Delta t$ = mean rate of heating

Tgl = annealing temperature

t_G = total duration of the thermal treatment

t_A = total heating time

tgl = total annealing time; and

rapidly cooling the alloys below 400° C. for maximally 5 seconds or less.

4,191,598
JET RECIRCULATION METHOD FOR VACUUM CARBURIZING

James G. Conybear, and Wallace J. Titus, both of Toledo, Ohio, assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed Aug. 21, 1978, Ser. No. 935,491
Int. Cl.² C21D 1/48
U.S. Cl. 148—16.5 **14 Claims**

1. An apparatus for recirculation of an atmosphere in a vacuum furnace having a furnace chamber, which comprises:

a recirculation loop which further comprises:

a low pressure line;

an outlet from the furnace chamber to the low pressure line;

a recirculation pump of the type which will translate a low pressure inlet stream to a high pressure outlet stream, connected to the low pressure line;

a high pressure line passing from the recirculation pump;

at least one jet inlet to the furnace chamber, for continuously forcing recirculationg furnace atmosphere into the furnace chamber, from the high pressure line;

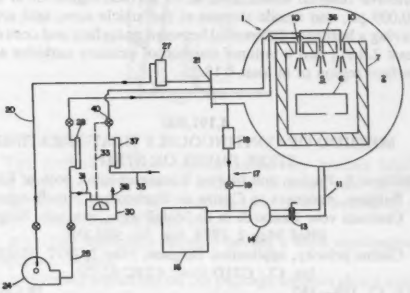
a means to analyze the furnace atmosphere, connected to the high pressure line;

an enriching gas line in communication with the furnace chamber;

a means to periodically withdraw gas from the furnace chamber whereby the furnace pressure is maintained.

7. A method for recirculation of an atmosphere in a vacuum furnace, having a furnace chamber and a recirculation loop with an inlet and outlet to the furnace chamber, which comprises:

starting up a recirculation pump of the type which will translate a low pressure inlet stream to a high pressure outlet stream, disposed within the recirculation loop;



drawing the atmosphere at a low pressure with the recirculation pump, from the furnace chamber, through a low pressure line, to the recirculation pump;

pumping the atmosphere to a higher pressure from the recirculation pump through a high pressure line and then to jet inlets into the furnace chamber;

continuously forcing recirculating atmosphere through the jet inlets into the furnace chamber to continuously circulate the atmosphere within the furnace chamber;

analyzing the atmosphere with a means to analyze which is connected to the high pressure line;

feeding enriching gas through an enriching line in communication with the furnace;

withdrawing gas periodically from the furnace chamber to maintain the pressure in the furnace chamber.

4,191,599
METHOD OF HEAT TREATING HIGH CARBON ALLOY STEEL PARTS TO DEVELOP SURFACE COMPRESSIVE RESIDUAL STRESSES

Charles A. Stickels, Ann Arbor, and Adam M. Janotik, Grosse Ile, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 13, 1978, Ser. No. 942,104
Int. Cl.² C21D 1/48
U.S. Cl. 148—16.5 **22 Claims**

1. A method of developing compressive residual stresses in the surface region of a high carbon steel alloy article, said method comprising:

(a) constituting said steel alloy article to contain 0.8–1.6% carbon, 0.2–5% chromium, and 0–20% alloying ingredients selected from the group consisting of manganese, vanadium, molybdenum, tungsten, silicon, the remainder being iron;

(b) heating said article to a temperature of 800°–950° C. (1472°–1742° F.) for 1–2.5 hours in a carburizing atmosphere effective to generate a differential in retained austenite, primary carbides and carbon between the surface region and core region of said article; and

(c) immersing said article in a cooling medium to quench the central core of said article at a rate sufficiently fast to effectively suppress the formation of non-martensitic aus-

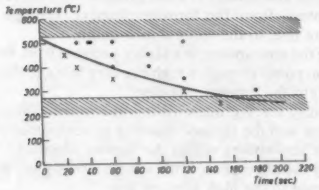
tenite decomposition products, thereby establishing a residual compressive stress gradient proceeding from the surface region of said article to a depth between 0.007–0.03 inches, the residual compressive stress being in the range of 5–40 Ksi.

14. A high carbon steel alloy article having gradients of compressive residual stress, and at least one of a carbon gradient and hardness gradient proceeding from the surface region of said article to its core, said article being characterized by a microstructure consisting essentially of tempered martensite, retained austenite and a carbide phase, said article having a chemical content consisting essentially of 0.8–1.6% carbon, 0.75–25% alloying ingredients including 0.2–5% chromium, the remainder being essentially iron, said article having a compressive residual stress level at its surface region of at least 10,000 psi, and tensile stresses at the article core, said article having a hardness differential between its surface and core of at least 2.0 R_c and a volume fraction of primary carbides at its surface region of at least 0.18.

4,191,600
METHOD OF CONTINUOUSLY HEAT-TREATING STEEL SHEET OR STRIP

Philippe A. Paulus, and Marios Economopoulos, both of Liege, Belgium, assignors to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie, Brussels, Belgium

Filed May 2, 1978, Ser. No. 902,258
Claims priority, application Belgium, May 2, 1977, 854191
Int. Cl.² C21D *9/48*; C22C *41/02*
U.S. Cl. 148—142 **19 Claims**



1. In a method of continuously heat treating cold-rolled steel strip or sheets, in which the strip or sheet is heated to a temperature higher than its recrystallisation temperature and subsequently cooled in two steps, the first taking place by immersion in an aqueous bath, the temperature of which is between 80° C. and 150° C., cooling taking place at a speed between 25° C./sec and 180° C./sec., the product of this speed times the thickness of the strip or sheet being higher than 25, the improvement wherein the first step ends when the temperature of the strip or sheet is between 200° C. and 425° C., and the second step also takes place in an aqueous bath, at a cooling speed between 90° C./sec and 500° C./sec to a temperature between 80° C. and 150° C., the product of the thickness of the strip or sheet times the cooling speed of the second step being higher than 75.

4,191,601
COPPER-NICKEL-SILICON-CHROMIUM ALLOY HAVING IMPROVED ELECTRICAL CONDUCTIVITY

Walter W. Edens, Hartland, and Quentin F. Ingerson, Wauwatosa, both of Wis., assignors to Ampco-Pittsburgh Corporation, Milwaukee, Wis.

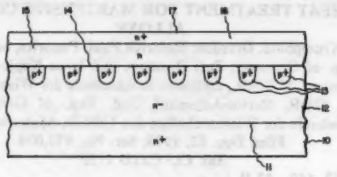
Filed Feb. 12, 1979, Ser. No. 11,110
Int. Cl.² C21D *1/00*; C22F *1/08*
U.S. Cl. 148—160 **8 Claims**

1. A method of heat treating a copper base alloy, consisting essentially by weight of 2.0% to 3.0% of a metal selected from the group consisting of nickel and cobalt and mixtures thereof, silicon in an amount slightly in excess of the stoichiometric amount necessary to form silicides of said metal, chromium in an amount in excess of the stoichiometric amount required to form chromium silicide with the excess silicon not combined as said metal silicides and the balance copper, comprising the steps of heating the alloy to a solution temperature, quenching the alloy, aging the alloy at a first aging temperature in the range of 900° F. to 1100° F. for a period of time sufficient to precipitate silicides, and aging the alloy at a second aging temperature in the range of 750° F. to 900° F. for a period of time sufficient to precipitate the excess chromium from solution and increase the electrical conductivity of the alloy to a value in excess of 45%.

4,191,602
LIQUID PHASE EPITAXIAL METHOD OF MAKING A HIGH POWER, VERTICAL CHANNEL FIELD EFFECT TRANSISTOR

Bantval J. Baliga, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 24, 1978, Ser. No. 899,119
Int. Cl.² H01L *21/208, 21/74, 29/80*
U.S. Cl. 148—171 **13 Claims**



1. The method of fabricating a high power field effect transistor comprising the steps of:

depositing silicon heavily doped to one type conductivity from a melt of silicon heavily doped to said one type conductivity, epitaxially on a major surface of a monocrystalline silicon substrate lightly doped to said one type conductivity;

forming a grid of silicon heavily doped to the opposite type conductivity at the exposed major surface of said substrate, said grid extending beneath the exposed major surface of said surface;

epitaxially growing an upper layer of silicon atop said exposed major surface of said substrate, said upper layer of silicon being doped to said one type conductivity at a level intermediate that of said substrate and that of said silicon deposited epitaxially from said melt; and

forming, at the exposed major surface of said upper layer, a heavily doped region of said one type conductivity extending into said upper layer a fraction of its depth.

4,191,603
MAKING SEMICONDUCTOR STRUCTURE WITH IMPROVED PHOSPHOSILICATE GLASS ISOLATION

Paul L. Garbarino, Ridgefield, Conn.; Martin Revitz, Poughkeepsie, and Joseph F. Shepard, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 1, 1978, Ser. No. 901,901
Int. Cl.² H01L *21/225*
U.S. Cl. 148—187 **6 Claims**

1. A process for defining areas of polysilicon material on a surface comprising:

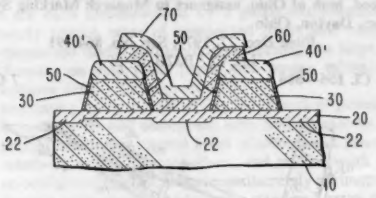
depositing a layer of polysilicon material on said surface;

depositing a layer of phosphosilicate glass over said layer of polysilicon material;

forming a pattern of openings in the phosphosilicate glass by photolithography and etching;

using the pattern in the phosphosilicate glass to form a like pattern in the polycrystalline silicon material wherein

there is undercutting under the phosphosilicate glass mask; and



substantially eliminating the undercutting under the phosphosilicate glass by heat treating the structure to cause the contraction of the phosphosilicate glass.

4,191,604

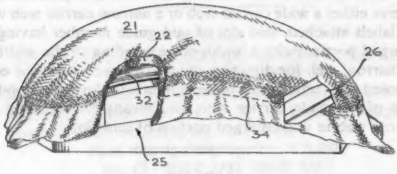
METHOD OF CONSTRUCTING THREE-DIMENSIONALLY CURVED, KNIT WIRE REFLECTOR

William L. MacTurk, Upland, Calif., assignor to General Dynamics Corporation Pomona Division, Pomona, Calif.

Continuation-in-part of Ser. No. 647,015, Jan. 7, 1976, abandoned, which is a division of Ser. No. 591,794, Jun. 30, 1975, abandoned. This application Apr. 24, 1978, Ser. No. 899,689

Int. Cl.² B29G *5/00*

U.S. Cl. 156—245 **13 Claims**



1. A method of constructing a three-dimensionally contoured, electromagnetic reflecting structure by means of first and second sheets of electric conductors, each consisting of flexible open loop knit mesh fabric, said method comprising the steps of:

constructing a mold having a three-dimensionally curved surface of desired shape;

stretching a first conductor forming a sheet of the knit mesh fabric smoothly and continuously over the curved surface of the mold;

securing edge portions of the first conductor to maintain the sheet in a stretched condition over the mold;

stretching a second conductor forming the second sheet of said knit mesh fabric over the curved surface of the mold, said second conductor being stretched approximately 50% greater so that the apertures formed between the loops of the two conductors are staggered with respect to each other to form a series of effective apertures of substantially smaller size than the apertures of either sheet, said effective apertures being less than 1/16 the wavelength of electromagnetic radiation in the range of intended use of the reflecting structure;

applying a thin coating of a thermo-setting resin into and over the meshes of said two conductors in such a manner that substantially the entire mesh fabric of said two conductors is covered by the resin;

applying at least one layer of knitted glass cloth over the coated electrical conductors; and

applying a thin coating of thermo-setting resin over the layer of glass cloth.

4,191,605

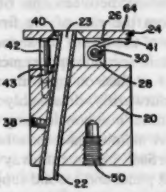
PACKAGE LABELING SYSTEM AND METHD FOR APPLYING A LABEL TO A PACKAGE

Fred H. Katterheinrich, Troy, and James R. Small, Tipp City, both of Ohio, assignors to Hobart Corporation, Troy, Ohio

Filed Nov. 20, 1978, Ser. No. 962,295

Int. Cl.² B29C *17/00*; B32B *31/00*; B65C *9/08*

U.S. Cl. 156—285 **12 Claims**



9. The method of receiving an adhesively backed label ejected from a label transport with the adhesive side of the label facing upward and applying the label to the bottom of a package, comprising the steps of:

(a) providing a package support having a label application opening therein,

(b) positioning a package on the package support above said label application opening, with the center of the package bottom offset with respect to said label opening,

(c) catching a label ejected from said label transport, with the adhesive side of the label facing upward, on a flat horizontal label supporting surface by means of a suction applied through a suction tube communicating with an aperture in the surface, said surface being positioned below said label application opening,

(d) raising said surface through said label application opening, with a label positioned thereon, to a label application position in which the bottom of said package adjacent said label application opening is contacted by said surface and raised out of contact with said package support, and said label supporting surface is tilted to reduce the suction applied through said aperture by said suction tube, whereby the adhesive side of said label causes said label to adhere to the bottom of said package.

4,191,606

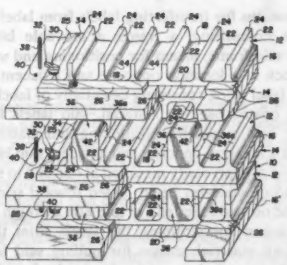
METHOD FOR SECURING COMPOSITION BOARD PANELS TOGETHER

Stephen M. Evans, 5514 Edlen Dr., Dallas, Tex. 75220

Continuation of Ser. No. 646,333, Jan. 2, 1976, abandoned. This application Jul. 5, 1978, Ser. No. 922,111

Int. Cl.² B32B *31/04*

U.S. Cl. 156—288 **3 Claims**



2. A method of rigidly securing first and second elongated, flexible panels of particle board having a plurality of parallel

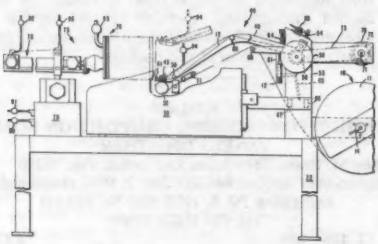
spaced ribs extending outwardly from a flat surface to form a single honeycombed core comprising the steps of: positioning the first panel such that the ribs extend outwardly on a first support member, said support member having a flat surface on opposite sides thereof; detachably securing said first panel from horizontal movement along the planar surface of said first support member and detachably securing said first panel from vertical movement away from said surface; securing one or more alignment members between the ribs such that they extend outwardly from the ribs of the first panel; applying adhesive to the edges of the ribs of the second panel; positioning the second panel on a second support member, said support member having a flat surface on opposite sides thereof such that the ribs extend outwardly; detachably securing said second panel from horizontal movement along the planar surface of said second support member and detachably securing said second panel from vertical movement away from said surface; positioning the second panel and second support member over the first panel and first support member such that the ribs of the second panel engage the sides of the alignment members such that the alignment members slide between the corresponding ribs of the second panel and the edges of the ribs are aligned with the edges of the corresponding ribs of the first panel; urging the edges of the ribs into engagement to form a single core; stacking a plurality of first and second combined support members relative to each other such that the individual ribs on each of the combined panels are aligned in vertical relationship to support the corresponding ribs on the adjacent panel; and applying external pressure evenly over the stack of combined first and second support members and panels for a predetermined period of time.

4,191,607

LABEL APPLICATOR

Andrew P. Cope, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 29, 1978, Ser. No. 891,399
Int. Cl.[2] B65C *9/18, 9/28*
U.S. Cl. 156—384 **2 Claims**



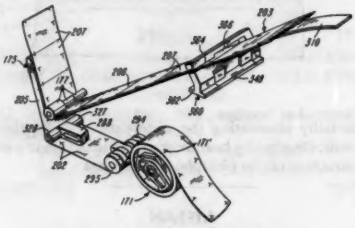
1. An apparatus for transferring labels from label stock to a label holder comprising: a frame; a movable label holder mounted on said frame; means for positioning and maintaining the label stock at a location opposite and adjacent said label holder, said label stock consisting essentially of labels attached to a release coated backing material, said labels facing said label holder, said means for positioning and maintaining the label stock at a location opposite and adjacent said label holder comprising: an arm pivotally mounted at one end to said frame, the other end of said arm being biased toward said location; means located on said other end of said arm through which the label stock passes for stripping the labels from the release coated backing material; means for pulling said label stock against the bias applied to said other end of said arm and through the means for stripping the labels from the backing material; and means for propelling the label to the label holder simultaneously with its release from the backing material.

4,191,608

HAND-HELD LABELER

Charles B. Bussard, Kettering, and William A. Jenkins, Englewood, both of Ohio, assignors to Monarch Marking System, Inc., Dayton, Ohio

Filed Dec. 27, 1977, Ser. No. 864,491
Int. Cl.[2] B32B *35/00*
U.S. Cl. 156—584 **7 Claims**



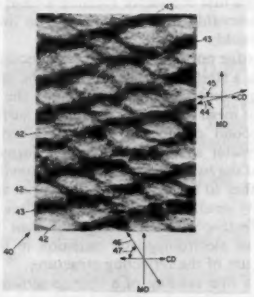
1. Label applying apparatus adapted to receive a web carrying a series of pressure sensitive labels, comprising means for delaminating the labels from the web, a movable feed member positioned to engage the web after the web is directed around the delaminating means, actuating means for moving the feed member to effect pulling of the web around the delaminating means for successively separating the labels from the web, guide means positioned to receive the carrier web with the labels attached, said guide means including a guide roller assembly and a guide member defining an open end slot extending laterally across the width of the web and positioned to receive either a wide carrier web or a narrow carrier web with the labels attached, said slot of said guide member having an enlarged portion with a width corresponding to the width of the narrow web for directing the narrow web with one edge disposed substantially in a plane common to the corresponding edge of the wide carrier web, and means for retaining the narrow web in said enlarged portion of said slot.

4,191,609

SOFT ABSORBENT IMPRINTED PAPER SHEET AND METHOD OF MANUFACTURE THEREOF

Paul D. Trokhan, Hamilton, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 9, 1979, Ser. No. 19,038
Int. Cl.[2] D21H *5/02, 5/24*
U.S. Cl. 162—113 **8 Claims**



1. A soft absorbent imprinted paper sheet characterized by a patterned array of relatively closely spaced uncompressed pillow-like zones which zones are each circumscribed by a picket-like lineament comprising alternately spaced areas of compacted fibers and relatively non-compacted fibers, said

zones being disposed in staggered relation in both the machine direction and the cross-machine direction of said paper sheet.

6. A method of manufacturing a soft absorbent sheet of paper characterized by a bilaterally staggered array of relatively closely spaced uncompressed pillow-like zones which zones are each circumscribed by a picket-like-lineament of alternately spaced areas of compacted fibers and relatively non-compacted fibers, said method comprising the steps of

a. forming an embryonic paper web having substantially uniform density throughout; and

b. imprinting, prior to final drying, a network of picket-like-lineaments on said embryonic web, said lineaments comprising alternately spaced areas of compacted fibers and relatively non-compacted fibers, and said network being so configured that the lineaments discretely perimetrically enclose each zone of a bilaterally staggered array of said uncompressed pillow-like zones in said embryonic paper.

4,191,610
UPGRADING WASTE PAPER BY TREATMENT WITH SULFITE WASTE LIQUOR

Eric S. Prior, Weideweg 1A, D-5166 Kreuzau-Untermaubach, Fed. Rep. of Germany

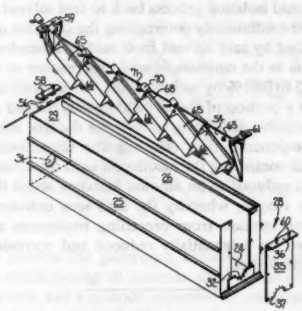
Continuation of Ser. No. 740,318, Nov. 9, 1976, abandoned, which is a continuation of Ser. No. 566,284, Apr. 9, 1975, abandoned. This application Sep. 1, 1978, Ser. No. 938,792
Int. Cl.² D21H *3/18*
U.S. Cl. 162—147 **22 Claims**

1. An article of manufacture comprising a cellulosic fibrous sheet material having incorporated therein, at the wet press or size press, from about 5 to 30 percent by weight of waste sulfite liquor, which liquor has been neutralized to a pH of about 6.5 to 8.0 with sodium aluminate prior to addition to said sheet material.

4,191,611
APPARATUS FOR ULTRASONICALLY CLEANING PAPER MAKING FELT

John C. Rushing, 413 E. Seven Oak Dr., Greenville, S.C. 29607; William E. Smith, Rte. 2, Box 24, and Henry L. King, P.O. Box 1255, both of Hartsville, S.C. 29550

Filed Sep. 1, 1978, Ser. No. 938,859
Int. Cl.² D21F *1/32*; B08B *3/12*
U.S. Cl. 162—273 **7 Claims**



6. In a continuous paper making apparatus which includes an endless paper making felt upon which the slurry is received, the combination therewith of means for cleaning the fibrous residue from the felt continuously during the paper making process, and which is characterized by the ability to permit rapid removal and/or replacement of the felt, said cleaning means comprising

an open, rectangular tank adapted to be filled with a cleaning bath, said tank comprising a bottom wall, opposing side walls, and opposing first and second end walls, with said end walls including aligned openings therethrough and which are positioned adjacent said bottom wall, and with said first end wall including a removable plate section having an upper edge which defines at least a portion of the upper periphery of such end wall and a lower edge which defines the upper periphery of the associated opening,

means for guiding a moving paper making felt through the tank so as to be immersed in the cleaning bath during a portion of the return run of the felt, and including a guide roll positioned adjacent the bottom wall of said tank, said guide roll having a support shaft extending coaxially from each end and with the shafts extending through said aligned openings of said tank end walls, releasable means for sealing each support shaft to its associated end wall, and means positioned outside each end wall of said tank for rotatably and releasably mounting said support shafts, whereby the moving felt is adapted to extend around said guide roll and define a U-shaped path of travel through the tank and which includes two oppositely directed runs,

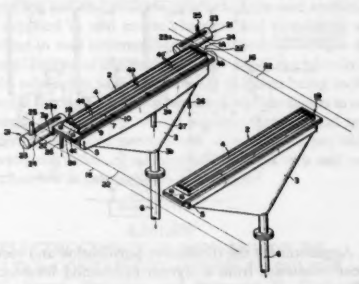
means for generating ultrasonic vibrations within the bath in said tank and including a support panel extending between said end walls and positioned between said runs of said U-shaped path of travel and directly above said guide roll, and a plurality of separate ultrasonic transducers mounted on said panel, with said generators being positioned to achieve a substantially uniform application of the ultrasonic vibrations across the full width of the moving felt, and

means for mounting said panel to said tank so as to permit the panel to be readily moved upwardly from said guide roll, whereby the endless felt may be replaced by moving the panel upwardly, releasing said sealing means, releasing the mounting of the ends of said guide roll support shafts, removing said plate section, and lifting the guide roll so that the felt may be slipped therebeneath.

4,191,612
DEWATERING SUCTION APPARATUS FOR PAPER MAKING MACHINE

Ikuo Araoka, 317 Iriyamase, Fuji-shi, Shizuoka, Japan

Filed Jul. 5, 1978, Ser. No. 922,166
Int. Cl.² D21F *1/52*
U.S. Cl. 162—352 **2 Claims**



1. A paper making machine including a dewatering suction apparatus having at least one suction box assembly which has opening means closed by the under surface of a wet paper conveyor belt, said suction box assembly comprising:

a plurality of foil plates extending parallel to the widthwise direction of said conveyor belt and defining a plurality of suction slots at said opening means;

an air outlet nozzle means extending parallel with said foil plates at the upstream side of the foil plates; and

auxiliary suction means at both side edge portions of said conveyor belt,

each auxiliary suction means comprising:
means defining a suction inlet opening extending beyond said side edge of said conveyor belt;
valve means movable along said suction inlet opening to limit the effective suction dimension of said suction inlet opening; and
sensing finger means secured to said valve means and sensing corresponding side edges of the conveyor belt by following said side edges to control the position of the valve means.

4,191,613
MALATE DEHYDROGENASE CONJUGATES FOR ENZYME IMMUNOASSAYS

Edwin F. Ullman, Atherton, and Kenneth E. Rubenstein, Menlo Park, both of Calif., assignors to Syva Company, Palo Alto, Calif.

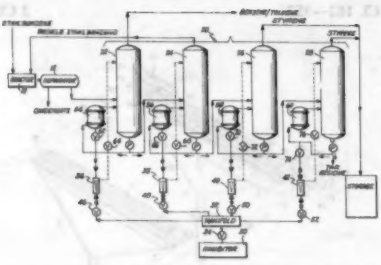
Continuation-in-part of Ser. No. 722,964, Sep. 13, 1976, Pat. No. 4,067,774, which is a continuation of Ser. No. 481,022, Jun. 20, 1974, abandoned, which is a continuation-in-part of Ser. No. 304,157, Nov. 6, 1972, Pat. No. 3,852,157, which is a continuation-in-part of Ser. No. 143,609, May 14, 1971, abandoned. This application Jan. 19, 1977, Ser. No. 760,499
The portion of the term of this patent subsequent to Dec. 3, 1991, has been disclaimed.
Int. Cl.² G01N *31/14*; C07G *7/02*
U.S. Cl. 435—188 **18 Claims**

1. An enzyme conjugate of malate dehydrogenase bonded to on the average with from about 1 to 18 haptens of molecular weight of from about 125 to 1,200 and having at least one heteroatom, wherein said conjugated enzyme retains at least about 2% of the original enzyme activity prior to conjugation and wherein the enzymatic activity of the conjugate is reduced by at least 30% when said haptens are bound to antibodies for said haptens.

4,191,614
DISTILLATION APPARATUS

James M. Watson, and Michael E. Johnson, both of Big Spring, Tex., assignors to Cosden Technology, Inc.,, Big Spring, Tex.

Filed Mar. 1, 1976, Ser. No. 662,566
Int. Cl.² B01D *1/00*
U.S. Cl. 202—177 **6 Claims**

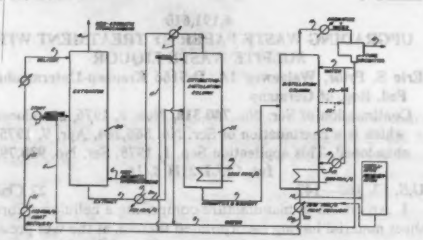


1. Apparatus for the distillative purification and recovery of styrene monomer from a styrene-containing feedstock, comprising:
(a) at least one distillation column for receiving said feedstock;
(b) a reboiler operatively associated with each column;
(c) gas injection means for introducing a gaseous inhibitor into each column;
(d) gas injection means for introducing a gaseous inhibitor into each reboiler;
(e) a source of gaseous inhibitor in operative communication with each of said gas injection means;
(f) gas flow control means including at least one valve member intermediate said source of gaseous inhibitor and each of said gas injection means for permitting controlled simultaneous apportionment of said gaseous inhibitor between each column and each reboiler, whereby polymerization of said monomer is prevented; and,
(g) means to recover said monomer.

4,191,615
PROCESS FOR OPERATING EXTRACTION OR EXTRACTIVE DISTILLATION APPARATUS

Martin Schulze, Neviges, and Gerhard Preusser, Essen, both of Fed. Rep. of Germany, assignors to Krupp-Koppers GmbH, Essen, Fed. Rep. of Germany

Continuation of Ser. No. 641,021, Dec. 15, 1975, abandoned. This application Dec. 23, 1977, Ser. No. 863,733
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1974, 2459534
Int. Cl.² B01D *3/40*; C23F *11/00*
U.S. Cl. 203—3 **9 Claims**



1. The improvement in a process for recovery of pure hydrocarbon compounds from a hydrocarbon mixture containing free acid ion impurities by a solvent extractive process and subsequent isolation of said pure hydrocarbon compounds from a solvent system in which process an N-substituted morpholine is employed as the selective solvent, said improvement comprising adding to said morpholine solvent or a mixture thereof with a minor amount of water at least one of the following compounds: phosphoric acid, a salt thereof, an inorganic vanadium compound or an inorganic molybdenum compound, said addition being effected in an amount of about 0.005 to 0.02% by weight of the morpholine solvent, continuously recycling the solvent mixture containing said additive recovered from said isolation process back to said solvent extractive process and continuously determining the contents of free acid ions absorbed by said solvent from said hydrocarbon mixture and, as soon as the contents of acid ions reaches an amount of about 0.005 to 0.01% by weight of the solvent mixture, removing at least a portion of the circulating solvent and subjecting it to regenerative distillation to separate the free acid ion containing components, thus effecting the regeneration of the solvent, and continuing the distillation until the content of free acid ions is reduced to an amount between about 0.0005 and 0.001% by weight, whereby the acid ions entrained in said hydrocarbon mixture from preceding treatments applied to said mixture are substantially reduced and corrosion caused thereby is prevented.

4,191,616
PURIFICATION PROCESS

Brian Baker, Middlesbrough, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Dec. 14, 1978, Ser. No. 969,435
Claims priority, application United Kingdom, Dec. 19, 1977, 52727/77
Int. Cl.² B01D *3/36*; C07C *51/46*
U.S. Cl. 203—44 **10 Claims**

1. A process for the purification of an alkane dicarboxylic acid having at least 4 carbon atoms which comprises co-distill-

ing said acid with an alkylbenzene having an atmospheric pressure boiling point within the range 300° to 350° C.

4,191,617

PROCESS FOR ELECTROPLATING DIRECTLY PLATEABLE PLASTIC WITH COBALT ALLOY STRIKE AND ARTICLE THEREOF

John L. Hurley, Mahwah, N.J.; Daniel Luch, Warwick, and Charles J. Knipple, Cornwall, both of N.Y., assignors to The International Nickel Company, Inc., Suffern, N.Y.

Filed Mar. 30, 1979, Ser. No. 25,492

Int. Cl.² B23P 3/20; C25D 5/10, 5/12, 5/14

U.S. Cl. 204—40 **4 Claims**

1. A process for electroplating directly plateable plastic comprising initially electrodepositing, directly on the plastic surface, an alloy containing about 10% to about 60% cobalt, balance essentially nickel and thereafer continuing electrodepositing electrodepositable metal on said plastic while maintaining said nickel-cobalt alloy at said plastic surface.

3. A process as in claim 1, wherein the initial deposit of alloy is about 0.1 to about 0.5 μm thick and is directly coated with a nickel electrodeposit at least about 0.9 μm thick.

4. An electroplated, directly plateable plastic object having directly adhered to the plastic surface thereof an electrodeposited nickel-cobalt alloy containing about 10% to about 60% cobalt.

4,191,618

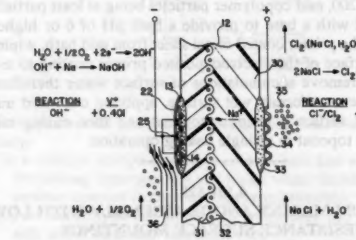
PRODUCTION OF HALOGENS IN AN ELECTROLYSIS CELL WITH CATALYTIC ELECTRODES BONDED TO AN ION TRANSPORTING MEMBRANE AND AN OXYGEN DEPOLARIZED CATHODE

Thomas G. Coker, Waltham; Russell M. Dempsey, Hamilton, and Anthony B. LaConti, Lynnfield, all of Mass., assignors to General Electric Company, Wilmington, Mass.

Continuation-in-part of Ser. No. 863,798, Dec. 23, 1977, abandoned. This application Jul. 6, 1978, Ser. No. 922,289

Int. Cl.² C25B 1/46, 9/04, 11/02, 13/08

U.S. Cl. 204—98 **25 Claims**



20. The process for generating chlorine and alkali which comprises electrolyzing an aqueous alkali metal chloride between an anode and a cathode separated by an ion exchanging membrane, at least the cathode electrode comprising a plurality of electroconductive catalytic particles bonded to said membrane to provide a gas and electrolyte permeable electrode to form a unitary electrode-membrane structure, applying a potential to the electrode through a separate electron conductive current collector in physical contact with the electrochemically active catalytic material bonded to the membrane, passing oxygen bearing gaseous stream to said cathode electrode to depolarize said electrode and to prevent hydrogen discharge at said electrode, said anode comprises a mass of electrocatalytic particles bonded to the surface of the ion exchange membrane.

4,191,619

PROCESS FOR CONVERSION OF MATERIALS IN ELECTROLYTIC SOLUTION

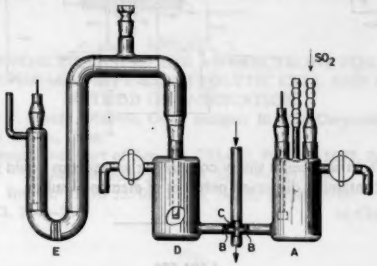
Bernd D. Struck, Langerwehe, Fed. Rep. of Germany, assignor to Kernforschungsanlage Julich Gesellschaft mit beschrankter, Julich, Fed. Rep. of Germany

Filed Sep. 25, 1978, Ser. No. 945,693

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1977, 2743820

Int. Cl.² C25B 1/02, 1/22

U.S. Cl. 204—104 **9 Claims**



1. An electrochemical conversion process utilizing an electrolytic cell containing permeable partitions subdividing the cell into an anode chamber for an anolyte solution present at least between the anode and one of said partitions, a cathode chamber for a catholyte solution, present at least between the cathode and the other of said partitions, and an intermediate chamber for an electrolyte solution between said partitions, said partitions serving to oppose the migration of electrochemical reaction products from the anolyte solution to the catholyte solution and vice versa, said process comprising the steps of:

supplying for and during the application of electrolyzing potential to said cell in the anode chamber an aqueous solution essentially containing an oxidizable anions and hydrogen ions;

supplying to said intermediate and cathode chambers an initial solute in water solution essentially containing hydrogen ion and an oxidation product of the said oxidizable ions supplied to said anode chamber and circulating said solutions in said intermediate and cathode chambers during application of electrolyzing potential, the circulation of said solution in said intermediate chamber being such as to pass it through the space between said partitions in such a manner that the flow of said solution through said space is laterally bounded on opposite sides by said partitions, whereby migration of said oxidizable anion into said cathode chamber is substantially prevented.

4,191,620

ELECTROCHEMICAL CONVERSION OF SULFUR-CONTAINING ANIONS TO SULFUR

Donald C. Young, Fullerton, and Raymond N. Fleck, West Covina, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

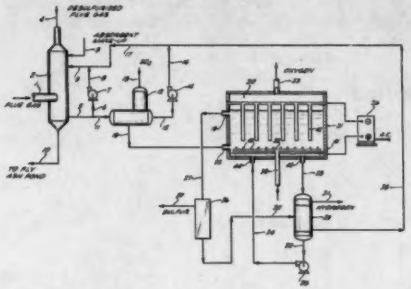
Filed Nov. 13, 1978, Ser. No. 960,300

Int. Cl.² C02C 5/12; C25B 1/00, 11/18

U.S. Cl. 204—149 **10 Claims**

1. A process for electrolytically converting sulfur-containing anions in an aqueous solution into elemental sulfur, which process comprises (1) introducing an aqueous solution comprising one or more sulfur-containing anions into an electrolytic cell containing at least one electrolyte chamber wherein said aqueous solution is in intimate contact with both an anode and an elemental mercury cathode, (2) passing an electric current of sufficient voltage across said electrodes through said

aqueous solution to cause one or more of the sulfur-containing anions to be converted to elemental sulfur, and (3) withdrawing from said cell a slurry comprising an aqueous liquid product containing dispersed particles of elemental sulfur.



4,191,621

PROCESS FOR THE PRODUCTION OF SUBSTITUTED BENZAL AND BENZYL BROMIDES

Jean Riethmann, Rheinfelden; Franz Marti, Dornach, and Tibor Somlo, Birsfelden, all of Switzerland, assignors to Ciba-Geigy Aktiengesellschaft, Basel, Switzerland

Filed Sep. 26, 1978, Ser. No. 945,957

Claims priority, application Switzerland, Sep. 30, 1977, 11985/77

Int. Cl.[2] B01J *1/10*

U.S. Cl. 204—158 HA 13 Claims

1. A process for the production of benzal or benzyl bromides which contain electrophilic substituents in the ortho- and/or para-position, or mixtures thereof, by the side-chain bromination of correspondingly substituted toluene, which comprises introducing elementary chlorine, under irradiation with visible light, into a two-phase system consisting of an aqueous phase and an organic phase and containing a correspondingly substituted toluene, at least one metal bromide, and a base.

4,191,622

APPARATUS AND METHOD FOR PRODUCING STEREO-REGULAR POLYMERS

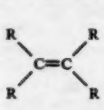
David C. Phillips, and Max Garbuny, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 28, 1975, Ser. No. 599,495

Int. Cl.[2] C08F *2/46*

U.S. Cl. 204—159.22 9 Claims

1. A method of producing stereo-regular polymers from a gaseous monomer having the general formula:



where each R is independently selected from hydrogen, alkyl to C_6, aryl, and alkylene, subject to the condition that at least one R group, the resonating R group, be a group which forms a permanent electric dipole moment with the remainder of the monomer, comprising irradiating said monomer with laser light which is nearly monochromatic of a frequency which resonates with a harmonic frequency resulting from the band between said resonating R group to the remainder of said monomer.

4,191,623

METHOD OF PRODUCING MICROPOROUS FILMS

Kuniyuki Hayasaka, and Yutaka Tamaoka, both of Akashi, Japan, assignors to Honny Chemicals Company, Limited, Kobe, Japan

Filed Dec. 20, 1977, Ser. No. 862,526

Claims priority, application Japan, Dec. 21, 1976, 51/152921

Int. Cl.[2] B01D *13/02*; C25B *13/00*

U.S. Cl. 204—180 R 12 Claims

1. A method of producing a microporous film comprising applying a film-forming dope containing a film-forming polymer and a solvent together with an ionizable organic compound on a support and passing said support through a coagulation bath between electrodes under the application of an electric current.

4,191,624

ELECTRODEPOSITION OF HIGH MOLECULAR WEIGHT COPOLYMERS

Arnold J. Josefson, Park Ridge, and Loren R. Munson, Libertyville, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Oct. 6, 1977, Ser. No. 840,033

Int. Cl.[2] C25D *13/16, 13/20*

U.S. Cl. 204—181 T 18 Claims

1. A method of electrodepositing a primer on a substrate and then overcoating said primed substrate while the primer is still wet so that both primer and topcoat can be cured in a single baking operation comprising, anodically electrodepositing a film characterized by increased strength and reduced tackiness on a metal sheet by passing a unidirectional electrical current through an aqueous bath having dispersed therein carboxyl-functional copolymer particles and heat-hardening formaldehyde condensate for curing the same and then through said metal sheet as anode to deposit a primer coating on said metal sheet, said copolymer particles being provided by copolymerization in the presence of free radical polymerization catalyst of monoethylenic monomers including from about 1% to about 30% by weight of monoethylenic carboxylic acid in an aqueous dispersion of said monomers in a liquid mixture containing at least 0.5% by weight of polyhydric alcohol having a molecular weight in the range of about 300 to about 6000, said copolymerization providing copolymer particles having an average molecular weight in the range of 10,000 to 50,000 and an acid value of 3–200, said copolymer particles being at least partially neutralized with a base to provide a bath pH of 6 or higher, removing the primer coated metal sheet from said bath, wiping the wet surface of the electrodeposited primer coating to mechanically remove accumulations of surface water therefrom and provide a uniformly wet surface, applying over said uniformly wet surface a resinous topcoat and then curing said primer and topcoat in a single baking operation.

4,191,625

ALUMINUM MARINE ANODE ASSEMBLY WITH LOW RESISTANCE SURFACE MOUNTINGS

Rolland C. Sabins, Lakeside, Calif., assignor to Sabins Industries, Inc., San Luis Rey, Calif.

Continuation-in-part of Ser. No. 707,675, Jul. 22, 1976, and Ser. No. 512,108, Oct. 4, 1974, abandoned, said Ser. No. 707,675, is a continuation-in-part of Ser. No. 512,108, , abandoned. This application Mar. 2, 1979, Ser. No. 17,051

Int. Cl.[2] C23F *13/00*

U.S. Cl. 204—197 8 Claims

1. Mounting structure for marine anodes, comprising:

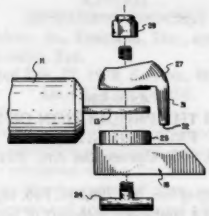
a metallic base welded to a ship's hull with sufficient weld material to provide a low resistance current path through said base to said hull, including spaced, upstanding sides and a top;

a tee bolt between said upstanding sides with a threaded shank extending up through said top;

a conductive mounting pad associated with said top and adapted to provide a low resistance current path into said

top surounding said threaded shank, constituting means for direct physical coupling to a mounting lug of a marine anode;

top washer means cooperatively adapted with said mounting pad to clamp said mounting lug therebetween; and



means for pressing said top washer down towards said mounting pad, thereby ensuring a low resistance current path from an anode associated with said mounting lug through said mounting pad and base to said hull.

4,191,626

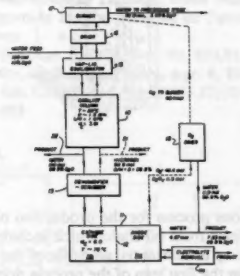
APPARATUS FOR FINISHING AND UPGRADING OF HEAVY WATER

Martin Hammerli, and John P. Butler, both of Deep River, Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Canada

Filed May 22, 1978, Ser. No. 908,226

Int. Cl.[2] C25B *1/10, 15/08;* C01G *57/00;* C01B *4/00*

U.S. Cl. 204—266 **7 Claims**



1. Apparatus for enriching and upgrading heavy water comprising:

(a) a catalyst isotope exchange column enricher with means for passing hydrogen gas and liquid water therethrough in counter-current isotope exchange relationship,

(b) an electrolysis cell having an anode side and a cathode side and a separator therebetween,

(c) a dehumidifier-scrubber,

(d) means for passing the liquid water enriched in deuterium from the catalyst column through the dehumidifier-scrubber to the electrolysis cell,

(e) means for passing the hydrogen gas evolved in the cathode side of the cell through the dehumidifier scrubber to the catalyst column, said dehumidifier-scrubber adapted to adjust the humidity of the depleted hydrogen gas to the conditions prevailing in the enricher, to bring the deuterium concentration of the water vapor in the gas stream in isotopic equilibrium with the liquid water from the enricher, and to transfer any entrained electrolyte in the hydrogen gas to the downflowing water stream,

(f) means for passing the hydrogen gas from the catalyst column to an output,

(g) means for introducing an input water feed containing a minor proportion of heavy water to the upper portion of the catalyst column,

(i) means for taking the oxygen gas evolved in the anode side of the electrolysis cell and highly deuterated water vapor from the cell and passing it through the gas drier to remove the water,

(j) means for returning this water to the cell,

(k) a burner for recombining the output hydrogen and oxygen,

(l) means for passing the dried oxygen gas to the burner, and

(m) means for taking a product enriched in deuterium from the system.

4,191,627

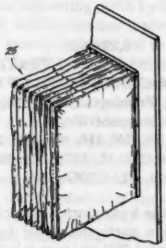
REINFORCED CASING FOR AN ELECTRODE FOR A DIAPHRAGM-TYPE ELECTROLYTIC CELL AND A METHOD OF FABRICATION

Steven J. Specht, Mentor, Ohio, assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 772,412, Feb. 28, 1977. This application Aug. 28, 1978, Ser. No. 937,358

Int. Cl.[2] C25B *13/02, 13/08, 11/03;* B32B *31/00*

U.S. Cl. 204—296 **16 Claims**



1. A separator structure for use in a diaphragm-type electrolytic cell, which structure comprises:

(a) a single piece of separator material which is of sufficient length and width to form an entire separator structure but of insufficient strength to resist mechanical forces thereon during operation of said cell;

(b) said piece being doubled back and forth to form a glove-like structure of a plurality of interconnected finger portions, each finger portion having at least two closed heat sealed edges, one closed folded edge and one open edge, each of said open edges facing in a common direction;

(c) said piece having integral mechanically reinforced borders along the full length of two opposite edges of said piece; and

(d) said borders being located such that the borders pass along the full length of said heat sealed edges, thereby reinforcing said edges.

4,191,628

PROCESS FOR REMOVAL OF MINERAL PARTICULATES FROM COAL-DERIVED LIQUIDS

William J. McDowell, Knoxville, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 12, 1978, Ser. No. 950,875

Int. Cl.[2] C10G *1/06, 29/12, 29/06*

U.S. Cl. 208—8 R **22 Claims**

1. A process for separating suspended mineral solids from a coal-derived liquid containing said solids comprising the steps of:

(a) contacting said coal-derived liquid containing said solids with a molten additive having a melting point of 100°–500° C. in an amount up to 50 wt.% with respect to

said coal-derived liquid containing said solids, said additive being present in an amount effective to increase the particle size of said mineral solids and comprising material or mixtures of material selected from the group of inorganic salts having antimony, tin, lithium, sodium, potassium, magnesium, calcium, beryllium, aluminum, zinc, molybdenum, cobalt, nickel, ruthenium, rhodium or iron cations and chloride, iodide, bromide, sulfate, phosphate, borate, sulfite, or silicate anions; and

(b) maintaining said coal-derived liquid in contact with said molten additive at said temperature range for sufficient time to permit said mineral matter to agglomerate, thereby increasing the mean particle size of said mineral solids; and

(c) recovering a coal-derived liquid phase from said contacting having reduced mineral solids content.

2. The process of claim 1 wherein said contacting step is performed by combining said additive with solid coal and reacting said coal with hydrogen at a temperature of 200° to 500° C. and a hydrogen pressure of 100 to 4500 psig for sufficient time to provide said coal-derived liquid containing said suspended solids in contact with said additive and at a temperature above the melting point of said additive.

4,191,629

REACTOR RESIDUUM CONCENTRATION CONTROL IN HYDROCONVERSION OF COAL

Michael C. Chervenak, Pennington, N.J., assignor to Hydrocarbon Research, Inc., Lawrenceville, N.J.

Continuation of Ser. No. 740,410, Nov. 10, 1976, abandoned. This application Oct. 30, 1978, Ser. No. 955,677

Int. Cl.[2] C10G *1/06*

U.S. Cl. 208—10 **5 Claims**

1. In a process for the hydroconversion of coal at elevated temperatures wherein a particulate coal having an average particle size of less than 1,000 microns is admixed with a hydrocarbon liquid to form a slurry containing about 30–50 weight percent solids, which is passed with hydrogen upwardly through an ebullated reaction zone wherein the coal is catalytically hydrogenated at reactor pressure conditions of about between 100–300 atmospheres to produce liquid and gaseous hydrocarbon products including a liquid residuum containing unconverted process solids, wherein said reaction zone liquid is maintained with a liquid residuum content of about 30–45 weight percent and unconverted process solids of between 10–25 weight percent by recycling a portion of the liquid product, the improvement which comprises:

(a) passing the hydrocarbon products to a phase separator operating under conditions of pressure not less than 90% of reactor pressure, and temperature conditions near reactor temperature for separation of gaseous hydrocarbons from liquid product;

(b) dividing a portion of the liquid product stream into a first stream for solids separation and a second stream for bypass;

(c) passing the first stream without further separation to a solids separation zone maintained substantially at reactor temperatures and pressure conditions not less than 90% of reactor pressure, whereby a portion of the solids are removed thereby forming a liquid stream containing reduced solids concentration and a stream of increased solids concentration;

(d) recovering the stream of increased solids concentration;

(e) blending the second liquid stream with a sufficient amount of the solids reduced liquid stream to form a combined liquid recycle stream containing between 5–15 weight percent solids;

(f) passing the solids reduced combined liquid stream to the reaction zone thereby maintaining the solids concentration in the reactor zone liquid between about 10–25 percent;

(g) recovering the portion of the reduced solids concentration stream not recycled; and

(h) recovering the converted product.

4,191,630

PROCESS FOR THE PRODUCTION OF SHALE OIL FROM OIL SHALES

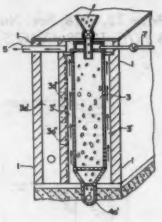
Jacque C. Morrell, 4501 Connecticut Ave. #516, Washington, D.C. 20008

Continuation-in-part of Ser. No. 769,885, Feb. 18, 1977, Pat. No. 4,105,536, which is a continuation-in-part of Ser. No. 679,315, Apr. 23, 1976, abandoned. This application Jul. 21, 1978, Ser. No. 926,638

The portion of the term of this patent subsequent to Aug. 8, 1995, has been disclaimed.

Int. Cl.[2] C10G *1/02*

U.S. Cl. 208—11 R **3 Claims**



1. A continuous process for the production of the shale oil and other products from oil shale which includes removing a relatively small, up to substantial amounts, of the water present in the oil shale in the first step of the process prior to recovery of the major amount of the oil by retorting the same to avoid sticky or pitch deposits and interference by the latter in the retorting step of the process which comprises subjecting the said oil shale in subdivided form to a preliminary step of indirect heat treatment in a partial dehydration step, collecting the vapors and gases from the said partial dehydration step in the temperature range from the ambient up to about 212° F. to about 550° F. to remove small, up to relatively large amounts of free and combined water from the oil shale, thereafter passing the heated partially dehydrated oil shale to the retorting step for further heat treatment at a substantially higher temperature than the preliminary step in the approximate range of about 800° F. to 1000° F. in a rotating substantially horizontal cylindrical vessel said heat treatments in the partial dehydration and retorting steps being effected by indirect heat exchange with hot combustion and flue gases therefrom which gases are not in direct contact with the oil shale, said further heat treatment being conducted while rotating the partially treated oil shale in a substantially horizontal cylindrical vessel, withdrawing the vapors and gaseous products resulting from the heat treatment of the said partial dehydration and retorting steps of the process, fractionating the vapors withdrawn from the retorting step whereby there is removed a light overhead product comprising vapors of low boiling hydrocarbons, wa-

ter, hydrocarbon gases and ammonia wherein the heavier conversion oil products from the oil shale are condensed and separated as a liquid for further treatment and use.

4,191,631

DEWAXING PROCESS

William P. Grisham, Jr., Pasadena, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 27, 1978, Ser. No. 881,283
Int. Cl.[2] C10G *43/08*
U.S. Cl. 208—33 **16 Claims**

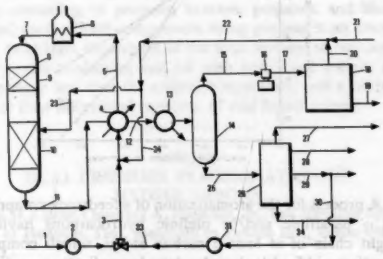
1. In a continuous multiple dilution process for dewaxing a wax-containing petroleum oil wherein a wax-containing petroleum oil feed is contacted with a ketone de-waxing solvent in a series of progressively cooler chilling zones to precipitate wax and provide wax and a wax-depleted oil, the improvement comprising, carrying out the contacting of the wax-containing oil in the presence of an effective amount of a polyalkyl acrylate crystal modified, and continuously apportioning the feed to provide in the initial contacting a solvent-oil mixture having a solvent to oil feed ratio of three or greater, and adding the remaining portion of the feed to the solvent-oil mixture when the point of incipient crystallization of the solvent-oil mixture is reached.

4,191,632

PROCESS FOR THE PRODUCTION OF BENZENE FROM HYDROCARBON FRACTIONS RICH IN ALKYL-AROMATIC HYDROCARBONS AND CONTAINING PARAFFINIC AND NAPHTHENIC HYDROCARBONS

Jean Cosyns, Maule; Christian Marcilly, Houilles; Jean Miquel, Paris, and Jean-Francois Le Page, Rueil Malmaison, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Apr. 6, 1978, Ser. No. 893,912
Claims priority, application France, Apr. 6, 1977, 77 10685
Int. Cl.[2] C07C *3/58*; C10G *37/10*
U.S. Cl. 585—483 **10 Claims**



1. A process for the production of benzene which comprises the steps of:

subjecting a hydrocarbon charge, rich in alkyl-aromatic hydrocarbons and containing approximately 2 to 20% by weight of iso and normal paraffinic hydrocarbons and naphthenic hydrocarbons or mixtures of these hydrocarbons, in a first catalytic zone, to a hydro-treatment carried out at a temperature of between 450° and 570° C. under a pressure of between 10 and 50 bars at a spatial velocity of between 0.1 and 10 cm^3 of liquid charge per cm^3 of catalyst and per hour with a H_2/hydrocarbon molar ratio of between 2 and 10, in the presence of a catalyst, said catalyst being a mixture containing (a) a mordenite containing less than 0.6% by weight of sodium, and having a pore size of between approximately 5 and 6 A and containing cations selected from the cations of the metals of groups VIII and IB of the Periodic Table, and (b) a reforming catalyst, the proportion of the latter forming 30 to 70% by weight of the mordenite;

passing at least a portion of the effluent from said first catalytic zone into a second zone and subjecting said effluent to hydrodealkylation, carried out either thermally at a temperature of between 620° and 720° C. or catalytically on a second catalytic bed at a temperature of between 500° and 650° C. under a pressure of between 10 and 50 bars, at a liquid spatial velocity of between 0.1 and 10, with a H_2/hydrocarbon molar ratio of between 2 and 10, the catalyst of said second catalytic bed comprising a non-selective carrier; and

separating and recovering benzene from the effluent from said second zone.

4,191,633

PROCESS FOR SUPPRESSION OF HYDROGENOLYSIS AND C_5+ LIQUID YIELD LOSS IN A REFORMING UNIT

Louis Dauber, Cranford, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jul. 10, 1978, Ser. No. 923,191
Int. Cl.[2] C10G *35/08*
U.S. Cl. 208—65 **9 Claims**

1. In a process for reforming, with hydrogen, a naphtha feed in a reforming unit which contains a plurality of catalyst-containing on-stream reactors connected in series, the hydrogen and naphtha feed flowing from one reactor of the series to another to contact the catalyst contained therein at reforming conditions, the improvement comprising

adding a maximum of about 0.01 percent sulfur, based on the total weight of the catalyst, to the catalyst of a reactor after the freshly prepared catalyst has been regenerated and reactivated about five times, or more, and injecting water into an on-line reactor of the series in concentration ranging from about 0.5 to about 50 wppm, based on feed, to maintain and control the sulfur level of the ctalyst.

4,191,634

OCTANE UPGRADING PROCESS FOR LIGHT PARAFFINS USING A COMBINATION OF TWO PALLADIUM-ZEOLITE CATALYSTS

Stephen J. Miller, Emeryville, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 2, 1978, Ser. No. 947,793
Int. Cl.[2] C10G *35/08*
U.S. Cl. 208—65 **7 Claims**

1. A process for upgrading a hydrocarbon paraffinic feed (a) boiling in the range of about from 25° C. to 70° C., (b) containing at least about 25 volume percent of a C_5 component and (c) having a research octane number below about 65, which comprises:

effectively increasing said octane number by consecutively contacting said feed with a first fixed bed catalyst and second fixed-bed catalyst, said contacting being under hydrocarbon conversion conditions, including:

(1) a temperature in the range of from about 250° to 315° C.;

(2) a pressure in the range of from about 20 to 54 atmospheres gauge;

(3) a hydrogen gas to hydrocarbon mol ratio in the range of from about 3–8 to 1; and

(4) a composite liquid hourly space velocity in the range of from about 0.5 to 2;

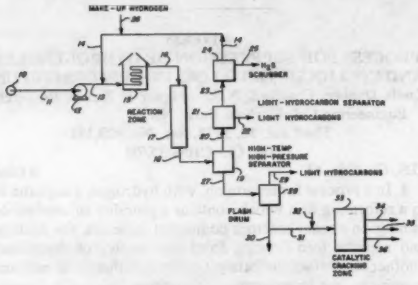
said first catalyst consisting essentially of palladium, ultrastable H-Y zeolite and alumina, said second catalyst consisting essentially of palladium, HZSM-5-type zeolite and alumina; and said catalysts each containing, for each 100 parts by weight thereof (a) an amount of palladium in the range of from about 0.1 to 1 part and (b) an amount of alumina and the respective zeolite in the range of from about 25 to 75 parts, and said ZSM-5-type zeolite having a silica-to-alumina ratio in the range of from about 40 to 160; and recovering the resulting hydrocarbon effluent

having, relative to said feed, an improved research octane number.

4,191,635
PROCESS FOR THE CRACKING OF HEAVY HYDROCARBON STREAMS

Leonard M. Quick, Naperville, Ill., and Albert L. Hensley, Jr., Munster, Ind., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 862,846, Dec. 21, 1977, abandoned. This application Dec. 7, 1978, Ser. No. 967,416
Int. Cl.² C10G *23/02*
U.S. Cl. 208—89 **35 Claims**



1. A process for hydrotreating and cracking a heavy hydrocarbon stream containing metals, asphaltenes, nitrogen compounds, and sulfur compounds, which process comprises: (a) contacting said stream in a hydrotreating zone under hydrotreating conditions and in the presence of hydrogen with a hydrotreating catalyst comprising molybdenum and chromium, said molybdenum and chromium being present in the elemental form, as oxides, as sulfides, or mixtures thereof, deposed on a large-pore, catalytically active alumina to reduce the metals content in said stream, to convert the asphaltenes, nitrogen compounds, and sulphur compounds in said stream, and to provide a hydrotreated product stream, said hydrotreating catalyst possessing a pore volume within the range of about 0.4 cc/gm to about 0.8 cc/gm, a surface area within the range of about 150 m^2/gm to about 300 m^2/gm, and an average pore diameter within the range of about 100 Å (10 nm) to about 200 Å (20 nm); and (b) catalytically cracking at least a portion of said hydrotreated product stream in a catalytic cracking zone under catalytic cracking conditions and in the presence of a cracking catalyst to produce gasoline and distillates in improved yields.

4,191,636
PROCESS FOR HYDROTREATING HEAVY HYDROCARBON OIL

Yoshio Fukui, Fujisawa; Yoshimi Shiroto, Yokohama; Mamoru Ando, Kawasaki, and Yasumasa Homma, Yokohama, all of Japan, assignors to Chiyoda Chemical Engineering & Construction Co., Ltd., Yokohama, Japan

Filed Jun. 6, 1978, Ser. No. 913,114
Claims priority, application Japan, Jun. 7, 1977, 52-66301
Int. Cl.² C10G *13/02, 23/02;* B01J *21/14*
U.S. Cl. 208—110 **11 Claims**

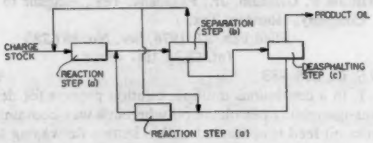
1. In a process for treating heavy hydrocarbon oil which contains asphaltene and heavy metals to continuously convert the oil into a substantially asphaltene-free and heavy metal-free oil comprising the steps of:

(a) contacting said reactor feed oil with hydrogen in the presence of a catalyst;

(b) separating said withdrawn hydrotreated product into a hydrogen-rich gas and a liquid product;

(c) separating the liquid product of step (b) into a substantially asphaltene-free and heavy metal-free light fraction and an asphaltene-containing and heavy metal-containing heavy fraction; and

(d) recycling said heavy fraction of step (c) to step (a), the improvement in step (a) comprising maintaining the reactor feed oil so as to contain at least 5 weight % of asphaltene and at least 80 ppm of vanadium, contacting said

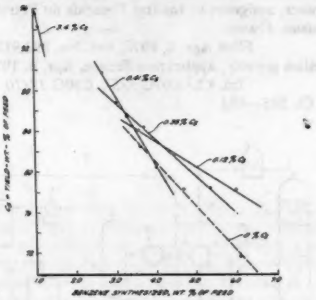


reactor feed oil with the catalyst compound of one or more catalytic metals selected from the groups Va, VIa and VIII in the Periodic Table, supported on a carrier containing magnesium silicate as the major component, and withdrawing the hydrotreated product without entraining the catalyst therein.

4,191,637
AROMATIZATION PROCESS AND CATALYST

Steven D. Light, Fullerton, and John W. Ward, Yorba Linda, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 842,221, Oct. 14, 1977, abandoned. This application Aug. 14, 1978, Ser. No. 933,626
Int. Cl.² C10G *35/08*
U.S. Cl. 208—139 **11 Claims**



1. A process for the aromatization of a feedstock comprising C_6–C_{12} paraffinic and/or olefinic hydrocarbons having a straight chain of at least 5 carbon atoms, which comprises contacting said feedstock under dehydrocyclization conditions with a catalyst comprising alumina and supported thereon about 0.1–2 wt.% Pt, about 0.1–3 wt.% Cl and sufficient Cs to provide a Cs/Cl atomic ratio between about 0.005 and 0.2.

4,191,638
REFORMING CATALYSTS

Charles J. Plank, Woodbury; Edward J. Rosinski, Pedricktown, both of N.J., and Edwin N. Givens, Bethlehem, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 757,113, Jan. 5, 1977, Pat. No. 4,141,859, which is a continuation-in-part of Ser. No. 503,131, Sep. 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 262,410, Jun. 13, 1972, abandoned. This application Oct. 23, 1978, Ser. No. 953,671
Int. Cl.² C10G *35/08*
U.S. Cl. 208—139 **19 Claims**

1. In a process for reforming a hydrocarbon charge stock

under reforming conditions by contacting said charge with a reforming catalyst, the improvement whereby the reforming catalyst is a reforming catalyst system in which the total catalyst combination comprises from about 1% to about 100% of a composite comprising

(a) an effective amount, up to about 25% by wt. of a crystalline aluminosilicate zeolite,

(b) not less than about 75%, by wt. of a carrier material,

(c) from about 0.01% to about 2%, by wt., of a platinum group metal either alone or in combination with other metals, and

(d) from about 0.01 to about 3%, by wt., of a halide

and from 0% to about 99% of a conventional reforming catalyst composition comprising

(a) a carrier material,

(b) from about 0.01% to about 2%, by wt., of a platinum group metal either alone or in combination with other metals,

(c) from about 0.01% to about 3%, by wt., of a halide

said total catalyst system having a K factor from about 1.5 to about 15, this factor being as defined in the specification in equations 2 and 3.

4,191,639

PROCESS FOR DEASPHALTING HYDROCARBON OILS

Costandi A. Audeh, and George C. Johnson, both of Princeton, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 31, 1978, Ser. No. 929,588

Int. Cl.[2] C10G *21/06*

U.S. Cl. 208—309 **6 Claims**

1. In the process for deasphalting an asphaltene-containing mineral oil, which process comprises contacting said oil with a liquid deasphalting solvent under conditions of temperature and pressure effective to form two liquid phases, a deasphalted oil phase and a tar phase, separating said liquid phases and recovering deasphalted oil from said deasphalted oil phase, the improvement which comprises utilizing a liquid deasphalting solvent consisting of at least two components selected from the group consisting of hydrogen sulfide, carbon dioxide, and light hydrocarbon, said light hydrocarbon being selected from the group consisting of propane, butanes, pentanes, and blends thereof, each of said components being present in an amount equal to at least 10 percent of the total volume of said liquid solvent, and contacting said oil with said liquid solvent at a temperature less than the critical temperature, and a pressure greater than the critical pressure, of said liquid solvent.

4,191,640

DUAL PRESSURE FRACTIONATION OF HYDROCARBONS

David D. Chess; Clements A. Heibling, Jr., and Randlow Smith, all of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

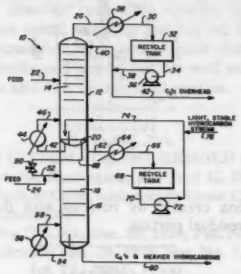
Filed Jun. 26, 1978, Ser. No. 919,197

Int. Cl.[2] B01D *3/10*; C10G *7/00*

U.S. Cl. 208—348 **24 Claims**

1. In a process for the dual pressure fractionation of a hydrocarbon feed stream containing unstable components comprising the steps of maintaining a high pressure fractionating zone, maintaining a low pressure fractionating zone, the pressure in said low pressure fractionating zone being lower than the pressure in said high pressure fractionating zone, introducing said hydrocarbon feed stream into one of said fractionating zones, recovering an overhead fraction from said low pressure fractionating zone, increasing the pressure of said recovered overhead fraction to the pressure of said high pressure fractionating zone, introducing said pressurized overhead fraction into said high pressure fractionating zone, recovering a first portion of the bottoms fraction from said high pressure fractionating zone, reducing the pressure of said recovered first portion of said bottoms fraction, introducing the depressurized first portion of said bottoms fractions into said low pressure fractionating zone, the improvement comprising:

introducing a stable hydrocarbon stream comprising hydrogenated overhead fraction from said high pressure fractionating zone into one of said fractionating zones, said



stable hydrocarbon stream being stable under the conditions existing in said high pressure fractionating zone, at least a portion of said stable hydrocarbon stream having a boiling point lower than the boiling point of at least one of said unstable components which accumulates in said high pressure fractionating zone.

4,191,641

FLOTATION PROCESS WITH USE OF XANTHOGEN CHLOROPROPYL FORMATE REAGENTS

Arthur H. Fischer, New York, N.Y.; Lawrence E. Strow, and Franklin A. Bolth, both of Baltimore, Md., assignors to Mineric Corporation, New York, N.Y.

Filed Jan. 26, 1978, Ser. No. 872,562

Int. Cl.[2] B03D *1/02*

U.S. Cl. 209—166 **5 Claims**

4. In the flotation of copper sulfide ores, the improvement comprising using as a flotation reagent therein the water-insoluble reaction product of an alkali metal lower alkyl xanthate solution and 2-chloro isopropyl chloroformate reacted in the range of 25° to 45° C. in the presence of excess alkyl alcohol used in the preparation of said xanthate.

4,191,642

METHOD OF SEPARATING GRANULAR POURABLE MATERIALS OF DIFFERENT DENSITIES IN A GASEOUS OR LIQUID MEDIUM

Klaus Limper, Gummersbach, Fed. Rep. of Germany, assignor to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Filed Jan. 25, 1978, Ser. No. 872,061

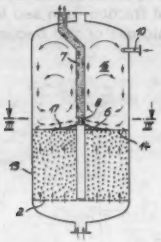
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1977, 2702987

Int. Cl.[2] B03B *11/00*

U.S. Cl. 209—495 **1 Claim**

1. A method of separating several granular pourable materials of different densities in fluidized bed layers including a lowest layer as well as a border surface of a next to the lowest layer formed by a fluidizing medium passing through each layer, which includes in combination the two steps of: first, successively withdrawing the layers above said lowest layer in sequence from top to bottom in downward direction from an axially located point slightly above the border surface of the next to the lowest layer, and secondly, rotating the fluidizing medium remaining above the residual portion of said next to

the lowest layer, while completely withdrawing the residual portion with the aid of a secondary radial flow toward the



central region created by rotating said fluidizing medium above said residual portion.

4,191,643

METHOD FOR THE MECHANICAL PREPARATION OF ORGANIC WASTES IN A BIOLOGICAL DIGESTION PROCESS

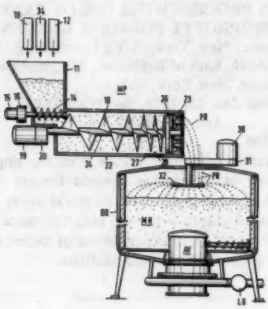
Franz X. Kneer, Eschenburg-Eibelshausen, Fed. Rep. of Germany, assignor to Gebruder Weiss K.G., Dillenburg, Fed. Rep. of Germany

Filed Feb. 17, 1978, Ser. No. 878,801

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1977, 2708313

Int. Cl.² C02C *3/00*

U.S. Cl. 210—4 **5 Claims**



1. Method of mechanically preparing organic waste, such as sewage sludge, animal defecated matter and the like, for introduction into a biological digestion process with the addition of carbon-containing matter, such as sawdust, into the organic waste, comprising the steps of moving the organic waste and added carbon-containing materials through a laterally closed housing and mixing the organic waste and added carbon-containing matter and at the same time compressing the combined material for effecting its dehydration and reducing its volume to approximately ½ of its initial volume at the completion of its passage through the housing, at the end of its movement through the housing discharging the material from the housing by pressing the material into and through at least one axially extending passageway having a first section followed by a second section having a diameter in the range of 10 to 20 mm, applying a further compressive force to the material with the force acting essentially perpendicularly to the axial direction of the passageway in the first section, smoothing the outside surface of the material within the second section and closing off any capillary opening in the outside surfaces of the material, forcing the material out of the second section so that a cylindrically shaped continuous piece of material of approximately 10 to 20 mm in diameter extends laterally unsupported from the second section with the laterally unsupported piece breaking off due to its own weight as it moves outwardly from the second section with the broken off pieces having a maximum length of approximately 150 mm and with each piece having a smooth surface extending in the length direction thereof and broken end surfaces, and feeding the pieces into an aeration reactor and forcing air into the reactor for effecting a spontaneous digestion process with the air flowing into the pieces through the broken end surfaces and flowing through the pieces in the length direction thereof.

4,191,644

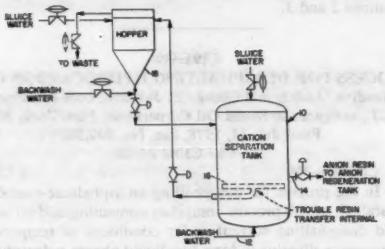
REGENERATION OF MIXED RESIN BED USED FOR CONDENSATE POLISHING

Michael J. Lembo, Scotch Plains, and James Y. Chen, Livingston, both of N.J., assignors to Belco Pollution Control Corporation, Parsippany, N.J.

Filed May 11, 1978, Ser. No. 905,078

Int. Cl.² B01D *15/06*

U.S. Cl. 210—33 **9 Claims**



1. A process for the regeneration of a spent mixed bed of cation and anion exchange resins having different densities, said process comprising:

(a) backwashing said spent mixed resin bed in a vessel to separate it into a first floating bed containing anion exchange resin granules and a minor amount of cation-exchange resin granules and a second floating bed containing the major part of the cation exchange resin;

(b) removing the major portion of the first floating bed from the vessel as a first cut;

(c) removing a second cut of resin granules consisting of the remainder of said first floating bed and a minor portion of said second floating bed, leaving the remainder of said second floating bed in the vessel as a third cut;

(d) transferring said second resin cut to a treatment zone and physically separating it into a cation resin portion and an anion resin portion;

(e) transferring said first resin cut to a anion resin treatment zone and contacting the resin with a base for regeneration of the anion resin;

(f) contacting said third resin cut with an acid for regeneration of the cation resin; and

(g) combining the regenerated cation resin of said third resin cut with the regenerated anion resin of said first resin cut to form a fresh mixed resin bed.

4,191,645

PROCESS FOR DEWATERING SEWAGE SLUDGE

Arthur J. Begala, Jr., Fairfield, and Ernest D. Kaufman, Stamford, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 15, 1977, Ser. No. 860,809

Int. Cl.² C02B *1/20*; C02C *3/00*

U.S. Cl. 210—47 **5 Claims**

1. In a process for dewatering sewage sludges wherein an effective amount of an inverted water-in-oil emulsion of a

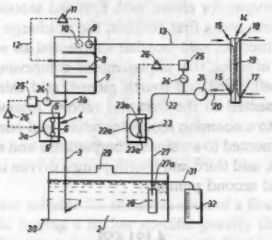
cationic copolymer is admixed therewith and water is removed from the thus-treated sludge, the improvement which comprises using as the water-in-oil emulsion one which contains a cationic copolymer of a major portion of a nonionic monomer and a minor amount of a cationic comonomer of greater reactivity than said nonionic monomer and is prepared by a process which comprises (1) preparing an aqueous solution of the total quantity of said nonionic monomer to be employed and up to about 95 mol percent of the total quantity of said cationic comonomer to be employed, thus providing a withheld portion of said cationic comonomer; (2) emulsifying said aqueous solution in a sufficient quantity of a hydrocarbon oil to provide a water-in-oil emulsion in which water comprises the dispersed phase; (3) initiating the polymerization reaction in said dispersed phase; and (4) continuing the polymerization reaction in said dispersed phase while incrementally adding thereto said withheld portion of said cationic comonomer until substantially all of the nonionic monomer and cationic comonomer have reacted.

4,191,646

APPARATUS FOR CONDUCTING FLUIDS IN A DIALYSIS SYSTEM

Lars-Ake L. Larsson, Loddekopinge, and Lars J. C. Traven, Lund, both of Sweden, assignors to Gambro AB, Sweden

Filed Oct. 13, 1977, Ser. No. 841,896
Claims priority, application Sweden, Oct. 14, 1976, 7611387
Int. Cl.[2] B01D *31/00*
U.S. Cl. 210—103 **19 Claims**



1. Apparatus for conducting fluids in a dialysis system having a dialyzer, a source of dialysis fluid for the dialyzer, heating means for heating dialysis fluid before introduction into the dialyzer, and pump means for pumping heated dialysis fluid to and through the dialyzer, said fluid conducting apparatus comprising:

a heating chamber for cooperation with said heating means to heat fluid introduced into said heating chamber, said heating chamber comprising a collapsible member having an inlet for introducing dialysis fluid into said collapsible member and an outlet for withdrawing fluid from said collapsible member;

first fluid conducting means for connection to the source of dialysis fluid and to said inlet of said heating chamber collapsible member for delivering dialysis fluid from the source of dialysis fluid to said heating chamber collapsible member;

second fluid conducting means for connection to said outlet of said heating chamber collapsible member, the dialyzer, and the pump means for conducting fluid from said heating chamber collapsible member to and through the dialyzer; and

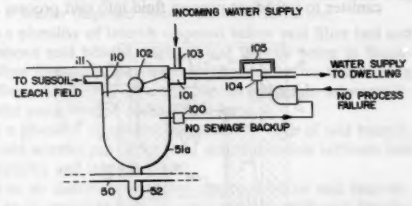
shut-off means associated with said second fluid conducting means for terminating the flow of fluid from said heating chamber collapsible member to the dialyzer to prevent the emptying of fluid from said heating chamber collapsible member, said shut-off means comprising first and second flexible wall portions of said heating chamber collapsible member, said first and second flexible wall portions being juxtaposed to one another and arranged to be free to move between an open, separated position and a closed, abutting position, and said outlet of said heating chamber collapsible member being positioned in said first flexible wall portion so that when the amount of fluid being withdrawn from said heating chamber collapsible member exceeds the amount of fluid being introduced into said heating chamber collapsible member and the amount of fluid in said heating chamber collapsible member falls below a predetermined value, said first and second flexible wall portions are caused to move towards said closed, abutting position whereby said second flexible wall portion closes said outlet in said first flexible wall portion.

4,191,647

FILTRATION SYSTEM FOR HOUSEHOLD SEWAGE

Steven B. Mullerheim, Kensington, and Fred G. Williams, Jr., San Anselmo, both of Calif., assignors to Great Circle Associates, Walnut Creek, Calif.

Division of Ser. No. 752,201, Dec. 20, 1976, Pat. No. 4,137,062.
This application Jan. 29, 1979, Ser. No. 7,207
Int. Cl.[2] B01D *35/00*
U.S. Cl. 210—128 **2 Claims**



1. A filtration system for household sewage, comprising:

a fresh water supply pipe for said household operably connected to a source of fresh water and to said household;

a sewage inlet line from the household;

filtering means for separating the sewage into liquid wastes and solid wastes;

means for delivering successive charges of sewage from the inlet line to the filtering means;

a surge reservoir connected into the sewage inlet line;

a first level sensor at a first level in the surge reservoir;

means operably connected to the first level sensor and to said fresh water supply pipe of the household for reducing the flow rate of fresh water through the supply pipe to a lower than normal rate when sewage in the surge reservoir has reached said first level;

a second level sensor at a second level in the surge reservoir, near its top; and

normally open valve means connected to the fresh water supply pipe of the household for shutting off the fresh water supply when sewage in the surge reservoir has reached said second level.

4,191,648

FILTRATION DEVICE FOR FILTERING TEMPERATURE CONTROLLED FLUIDS

Stephen J. Kaplan, 4420 Cezanne Ave., Woodland Hills, Calif. 91364, and Ladislaus S. Lengyel, 25623 Bellerise Dr., Valencia, Calif. 91355

Filed Feb. 6, 1978, Ser. No. 875,599
Int. Cl.[2] B01D *35/18, 29/32*
U.S. Cl. 210—186 **27 Claims**

1. A filtration apparatus for filtering contaminants from a temperature controlled process fluid, said apparatus comprising:

(a) an outer housing,

(b) a wall having a size smaller than said housing located

within said housing and being spaced therefrom to form a temperature controlling fluid chamber surrounding at least a portion of said wall,

(c) a filter canister disposed within said housing and being removable therefrom, said canister having a central process fluid receiving chamber and a filtering element therein for removing contaminants from a temperature controlled process fluid delivered to said process fluid receiving chamber,

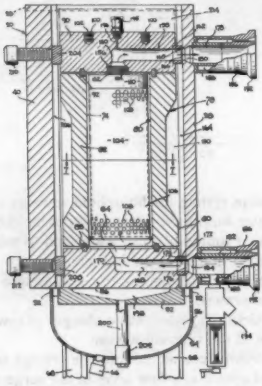
(d) a process fluid inlet on said canister for receiving the process fluid and delivering the process fluid to said filtering element,

(e) a process fluid outlet on said canister for delivering a filtered process fluid from said canister,

(f) means operatively associated with said housing for delivering a temperature controlling fluid to said temperature controlling fluid chamber to surround at least a portion of said canister and provide heat to the temperature controlled process fluid passing through said canister,

(g) means operatively associated with said housing to remove said temperature controlling fluid from the surrounding relationship around at least said portion of said canister,

(h) first process fluid transfer means operatively connected through said housing and alignable with the inlet on said canister to introduce process fluid into said process fluid



receiving chamber, said first process fluid transfer means comprising a process fluid inlet pipe delivering process fluid at least to said housing,

(i) a first temperature controlling fluid jacket surrounding said inlet pipe to maintain a flow of temperature controlling fluid around said inlet pipe at least to said housing,

(j) second process fluid transfer means operatively connected through said housing and alignable with the outlet on said canister to remove process fluid from said process fluid receiving chamber, said second process fluid transfer means comprising a process fluid outlet pipe for removing process fluid from said housing and extending to and at least partially into said housing,

(k) a second temperature controlling fluid jacket surrounding said outlet pipe to maintain a flow of temperature controlling fluid around said outlet pipe and extending into said housing,

(l) means forming an opening in said housing for inserting and removing said canister from said housing, and

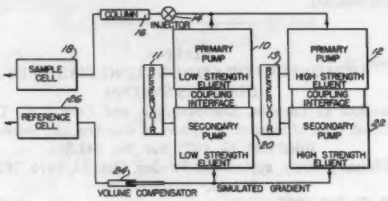
(m) alignment means cooperating between said housing and said canister to permit alignment of said inlet and first transfer means and outlet and second transfer means when said canister is located within said housing, in only a certain orientation such that said canister can be inserted into said housing permitting the process fluid inlet to be in fluid communication with the first process fluid transfer means without coupling of any mechanical connection and said process fluid outlet to be in fluid communication with the second process fluid transfer means without coupling of any mechanical connection, said cannister also being removable from said housing without uncoupling any mechanical connection between said process fluid inlet and said first process fluid transfer means and between said process fluid outlet and said second process fluid transfer means.

4,191,649

LIQUID CHROMATOGRAPHY SYSTEM WITH SIMULATED GRADIENT

Richard A. Hartwick, Old Mine Rd., Layton, N.J. 07851

Filed Oct. 23, 1978, Ser. No. 953,699
Int. Cl.[2] B01D *15/08*
U.S. Cl. 210—198 C **4 Claims**



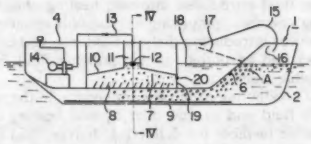
1. In a liquid chromatography system having a first and second reservoirs for eluent with first and second pumps connected thereto and a first conduit, the discharge of the pumps connected thereto, said conduit connected to a column and sample cell in series, that improvement comprising providing a reference cell, third and fourth pumps, said third and fourth pumps connected to the first and second reservoirs and discharging into a common second conduit, said common second conduit connected to a volume compensator and said reference cell in series, said third and fourth pumps driven in unison with said first and second pumps.

4,191,650

OIL-COLLECTING SHIP FOR OIL SPILLS

Hiroto Muneta, Kashiwa, Japan, assignor to Mitsui Ocean Development & Engineering Co., Ltd., Tokyo, Japan

Filed Jul. 3, 1978, Ser. No. 921,588
Claims priority, application Japan, Oct. 13, 1977, 51-136242
Int. Cl.[2] E02B *15/04*
U.S. Cl. 210—242 S **7 Claims**



1. An oil-collecting ship for oil spills comprising a pair of laterally-spaced side hulls forming a flow passage therebetween, a center hull having wall means forming a well having a bottom with an opening in said flow passage between said hulls, a deflector having a forwardly inclined segment formed at the forward part of said bottom to project above the water surface and deflect a stream into said flow passage below said bottom, said well opening in the bottom being behind the inclined segment to permit oil carried by the stream in said flow passage to float upwardly into said well, said segment being spaced forwardly from a forward wall of said well to form a splash chamber therebetween, a return-wave receiving splash plate curving over the top end of the inclined segment in

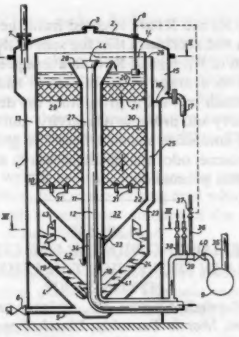
spaced relation thereto and forming an opening between a front end of said splash plate and the inclined segment, and overlying at the other end said splash chamber rearwardly of the inclined segment, said splash plate being operable to direct upward splashes from said segment into said splash chamber, and a communication passage connecting the chamber with the well.

4,191,651

SEPARATOR FOR TWO IMMISCIBLE LIQUIDS

Philippe J. Cheysson; Luc Delons, and Yvon J. Le Guen, all of Le Havre, France, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Feb. 21, 1978, Ser. No. 879,414
Claims priority, application France, Feb. 23, 1977, 77 05315
Int. Cl.² B01D 23/16
U.S. Cl. 210—265 **5 Claims**



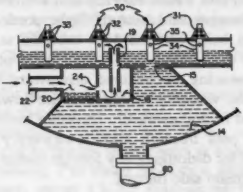
1. A separator suitable for the separation of a first liquid and a second liquid having a higher specific gravity than the first liquid from a liquid mixture containing both liquids, the liquids being mutually immiscible, the separator comprising an inlet for introducing the mixture into a first separation zone so constructed and arranged as to promote the separation by gravity of a substantial part of the first liquid from the mixture, a first liquid outlet for the discharge of separated first liquid from the separator, a second liquid outlet for the discharge of separated second liquid from the separator, means for causing first liquid separated in the first separation zone to pass to the first liquid outlet, means for causing the remaining liquid mixture containing a minor proportion of the first liquid and a major proportion of the second liquid to pass towards the second liquid outlet along a flow path including a part extending downwardly through a second separation zone, said second separation zone including an upper horizontally extending pre-filter zone contained between upper and lower perforated plate means, and a lower main filter zone disposed below said pre-filter zone, said main filter zone being partially filled with a liquid-permeable bed of powdered filter material whereby a vertically extending unfilled chamber is defined between the top of the powdered filter material and the lower perforated plate means, means for drawing fluid from the bottom of the main filter zone to the second liquid outlet, and means for periodically interrupting the separation of the mutually immiscible liquids and backwashing the second separation zone with an up-flowing mixture of the second liquid and a gas to agitate and suspend said powdered filter material in the main filter zone in the chamber below said pre-filter zone, said pre-filter zone preventing further upward travel and loss of said powdered filter material from said separator during backflushing.

4,191,652

APPARATUS FOR FILTER BACKWASHING

Edward A. Whitmore, Salt Lake City, Utah, assignor to Envirotech Corporation, Menlo Park, Calif.

Filed Dec. 22, 1977, Ser. No. 863,380
Int. Cl.² B01D 23/24
U.S. Cl. 210—274 **25 Claims**



11. A filtration apparatus in which a liquid to be filtered passes through a filter bed, and in which said filter bed can be backwashed by pressurized air and water, said apparatus comprising:

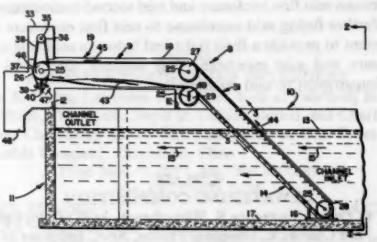
(a) a vessel having a floor structure to support said filter bed;
(b) a header disposed below said floor structure;
(c) a plurality of laterals disposed below said filter bed and above said header, each of said laterals being in liquid-flow communication with said header so that water rising from said header into said laterals can attain substantially the same level in each of said laterals;
(d) a plurality of nozzles connected to each of said laterals, said nozzles providing fluid communication between said laterals and said filter bed;
(e) an air distribution plenum disposed below said laterals;
(f) an air manifold in fluid communication with said distribution plenum;
(g) a plurality of conduits, each one of said conduits providing fluid-flow communication between a corresponding one of said laterals and said air distribution plenum;
(h) means for introducing pressurized air into said air manifold so that cushions of air can be formed in said manifold, in said distribution plenum and in said laterals, thereby providing a substantially uniform air pressure for backwashing air passing into said filter bed via said nozzles.

4,191,653

SELF WASHING BELT STRAINER

Quentin L. Hampton, 129 Anchor Dr., Daytona Beach, Fla. 32019

Filed Feb. 27, 1979, Ser. No. 15,795
Int. Cl.² B01D 33/04
U.S. Cl. 210—396 **8 Claims**



1. A self washing belt strainer comprising a rigid frame adapted to be secured partially in and partially above a flowing stream of liquid, a plurality of rollers rotatively mounted in said frame, an endless strainer trained over said rollers including an inclined front flight portion and an inclined rear flight

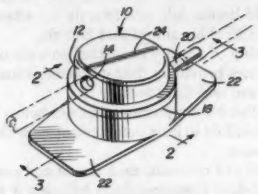
portion each partially submerged in the flowing stream and each inclined in a direction away from the direction of flow, drive means connected to one of said rollers, said strainer including a top flight portion forming a continuation of the upwardly traveling front flight portion and a bottom flight portion disposed directly beneath said top flight portion, a driven cleaning means disposed beneath said aforementioned rollers and around which said top and bottom flight portions travel for cleaning said bottom flight portion, said bottom flight portion being twisted 180° between said roller and a second roller over which said bottom flight portion is trained before commencing its inclined downward travel into the flowing stream, whereby the liquid of the flowing stream after being strained by the upwardly traveling inclined front flight portion will pass through said downwardly traveling rear flight portion for dislodging any foreign matter clinging to the outer downstream side thereof.

4,191,654

DEVICE FOR HOLDING MEMBRANE FILTER

Roger R. Larson, Champaign, Ill., assignor to Pharmaco, Inc., Champaign, Ill.

Filed Jul. 6, 1978, Ser. No. 925,630
Int. Cl.[2] B01D *25/04*
U.S. Cl. 210—451 **7 Claims**



1. A membrane filter holder comprising:

(a) A first thermo-plastic enclosure having an inlet port and a first peripheral recess,

(b) A second thermo-plastic enclosure having an outlet port and a second peripheral recess,

(c) A filter membrane of flat plastic sheet material, and

(d) Means consisting of a flat porous metal support plate, dimensioned and positioned to fit between and within said first peripheral recess and said second peripheral recess, said means functioning both to support said filter membrane and, when subjected to induction heating, to provide a means to fuse said first enclosure to said second enclosure, to only a dimension from within said holder sufficient to form a fluid tight plastic to plastic seal between said first enclosure and said second enclosure, while further fusing said membrane to said first enclosure sufficient to provide a fluid tight seal between said first enclosure and said membrane, but without substantial heat impairment to said membrane.

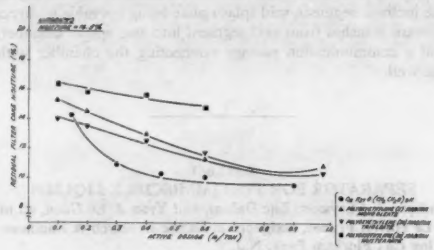
4,191,655

DEWATERING COMPOSITION

John E. Quinn; Lawrence S. Wittenbrook, both of Doylestown, Pa., and Charles E. Donegan, Tucson, Ariz., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Jul. 7, 1977, Ser. No. 813,573
Int. Cl.[2] C09K *3/00*
U.S. Cl. 252—60 **18 Claims**

1. A composition for addition to an aqueous slurry of an ore concentrate to improve dewatering thereof upon subsequent filtration which composition comprises a dewatering aid having the formula



$$R_2-\overset{R_1}{\underset{R_3}{C}}-O(CH_2CH_2O)_nH$$

wherein R_1, R_2 and R_3 are selected from the group consisting of hydrogen and alkyl such that the sum of the total number of carbon atoms in R_1, R_2 and R_3 is an average of from about 6 to 17, and n is an average of about 1 to 7; and a water soluble emulsifier which will aid in promoting the dispersibility of the aid in the slurry and promote its activity; and a solvent for said aid and said emulsifier selected from the group consisting of light oil, kerosene, odorless kerosene, heavy aromatic naphtha, and naphthenic process oil.

4,191,656

NON-YELLOWING BIOCIDE FOR CONTROL OF BACTERIA IN SPIN FINISH EMULSIONS USED ON NYLON YARN

Robert M. Marshall, Chester, Va., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Oct. 5, 1978, Ser. No. 948,835
Int. Cl.[2] D06M *16/00*
U.S. Cl. 252—8.6 **11 Claims**

1. A finish composition for treating polyamide yarn, said finish composition resisting bacteria growth and causing said treated yarn to resist yellowing under steam heat treatment, said finish composition consisting essentially of:

a. from about 99.5 to 99.995 percent by weight of an oil in water emulsion, about 10 to 20 percent by weight of said emulsion being an oil portion, said oil portion consisting essentially of from about 55 to 65 percent by weight of coconut oil, about 20 to 35 percent by weight of polyoxyethylene hydrogenated castor oil, and about 7 to 15 percent by weight of potassium salt of polyoxyethylene tridecyl phosphate; and

b. from about 0.005 to 0.500 percent by weight of 2[(hydroxymethyl)amino]ethanol.

4,191,657

COMPOSITIONS FOR ACIDIZING SUBTERRANEAN FORMATIONS

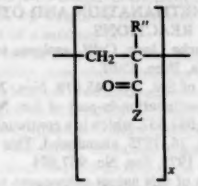
Billy L. Swanson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 643,983, Dec. 24, 1975, Pat. No. 4,103,742.
This application May 2, 1978, Ser. No. 902,122
Int. Cl.[2] E21B *43/27*
U.S. Cl. 252—8.55 C **9 Claims**

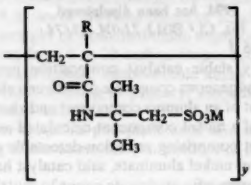
1. A gelled acidic composition, suitable for matrix-acidizing or fracture-acidizing of a porous subterranean formation susceptible of attack by an acid, comprising:

water;

from 0.2 to 3 weight percent, based on the total weight of said composition, of a water-dispersible random copolymer represented by the formula



I



II

wherein: R and R" are each a hydrogen atom, or a methyl radical; M is hydrogen, sodium, or potassium; Z is either —NH_2 or —OM in the above Type I monomer units, with the proviso that the copolymer contains at least 10 mol percent of said Type I monomer units in which Z is —NH_2; and x and y are the mol percent values of the respective monomer units I and II, with x being in the range of from 20 to 95 and with y being in the range of from 5 to 80;

from 0.4 to 60 weight percent, based on the total weight of said composition, of a non-oxidizing acid which is capable of reacting with a significant amount of the acid-soluble components of said formation; and

from 0.001 to 5 weight percent, based on the total weight of said composition, of a water-dispersible aldehyde selected from the group consisting of aliphatic monoaldehydes having from 1 to 10 carbon atoms, glyoxal, glutaraldehyde and terephthaldehyde;

said polymer, said acid, and said aldehyde, in the amounts used, being sufficiently compatible with each other in an aqueous dispersion thereof to permit gelation and thus form a said composition having sufficient stability to degeneration by the heat of said formation to permit good penetration of said composition into said formation when injected thereinto and the maintenance of said composition in said formation in contact therewith for a period of time usually sufficient for the acid in said composition to react significantly with the acid-soluble components of said formation and stimulate the production of fluids therefrom.

4,191,658

HOT MELT METAL WORKING LUBRICANTS AND METHODS FOR THEIR APPLICATION

Richard W. Jahnke, Mentor-on-the-Lake, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Division of Ser. No. 731,060, Oct. 27, 1976, abandoned, which is a continuation-in-part of Ser. No. 547,896, Feb. 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 513,617, Oct. 10, 1974, abandoned. This application May 8, 1978, Ser. No. 903,640

Int. Cl.² C10M *5/24, 5/22, 7/46, 7/24*

U.S. Cl. 252—32.7 E **31 Claims**

1. A method for lubricating metal during working thereof which comprises applying to said metal a lubricating composition which provides lubricity thereto and which comprises at least one ester of an aliphatic polycarboxylic acid having about 4–25 carbon atoms and a hydroxy compound having the formula $R'(OH)_n$, wherein R' is a hydrocarbon-based radical and n is an integer from 1 to 3; said composition melting within the range of about 30°–100° C.

4,191,659

SULFURIZED COMPOSITIONS

Kirk E. Davis, Euclid, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 814,573, Jul. 11, 1977, Pat. No. 4,119,549, which is a continuation-in-part of Ser. No. 666,546, Mar. 15, 1976, abandoned, which is a continuation-in-part of Ser. No. 560,675, Mar. 21, 1975, abandoned. This application Oct. 6, 1978, Ser. No. 949,286

The portion of the term of this patent subsequent to Oct. 10, 1995, has been disclaimed.

Int. Cl.² C10M *1/38, 3/32;* **C07G** *17/00*

U.S. Cl. 252—45 **45 Claims**

1. A method for the preparation of a sulfurized composition which comprises the steps of reacting at about 50°–300° C., under superatomspheric pressure and in the presence of a catalyst, sulfur and hydrogen sulfide with at least one olefinic compound containing 3 to about 30 carbon atoms to form a sulfurized mixture; about 1.2–3.0 gram-atoms of sulfur and about 0.1–1.5 moles of hydrogen sulfide being used per mole of olefinic compound; and removing from said sulfurized mixture substantially all low boiling materials including unreacted olefin, mercaptan and monosulfide.

4,191,660

ORGANOLEPTIC USES OF 1-(3,3-DIMETHYL-2-NORBORNYL)-2-PROPANONE IN CATIONIC, ANIONIC AND NONIONIC DETERGENTS AND SOAPS

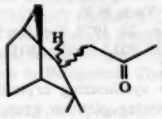
William L. Schreiber, Jackson; James N. Siano, Keyport; Manfred H. Vock, Locust, all of N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 881,331, Feb. 27, 1978, abandoned, which is a division of Ser. No. 819,951, Jul. 28, 1977, Pat. No. 4,090,985, which is a division of Ser. No. 747,308, Dec. 3, 1976, Pat. No. 4,053,657. This application Aug. 10, 1978, Ser. No. 932,615

Int. Cl.² C11D *9/44, 3/50*

U.S. Cl. 252—174.11 **2 Claims**

1. A process for augmenting or enhancing the aroma of a solid or liquid detergent consisting essentially of the step of intimately admixing with a solid or liquid detergent base a compound having the structure:



wherein the wavy lines are representative of "exo" or "endo" configurations.

4,191,661

ALKALINE DISHWASHER DETERGENT

Linda A. Halas; Lawrence A. Gilbert, both of Fairfield; Robert A. Staab, Cincinnati; Royal D. Collins, Bethel, and Charles R. Ries, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 7, 1977, Ser. No. 849,131

Int. Cl.² C11D *7/54*

U.S. Cl. 252—103 **16 Claims**

1. An automatic dishwashing composition providing optimum cleaning and spotting and filming characteristics consisting essentially of:

(1) from about 20% to about 50% of a sequestering builder selected from the group consisting of alkali metal, tripolyphosphates and pyrophosphates; (2) from about 8% to about 20% trisodium phosphate; (3) from about 5% to

about 20% of SiO_2 as an alkali metal silicate having an SiO_2:M_2O ratio of from about 1.6 to about 3.3, wherein M is selected from the group consisting of sodium and potassium;

(4) available chlorine at a level of from about 1% to about 3%; and

(5) from about 2.5% to about 15% of a low foaming nonionic surfactant having the formula $RO—(C_2H_4O)_xR^1$ wherein R is an alkyl group containing from about 17 to about 19 carbon atoms, x is a number from about 6 to about 15, and R^1 is selected from the group consisting of hydrogen, an alkyl or acyl group containing from one to about 5 carbon atoms and a group having the formula $—(C_yH_{2y}O)_nH$ wherein y is 3 or 4 and n is a number from one to about 4,

said composition having a pH of from about 10.5 to 11.2 at 2,500 ppm and being substantially free of (1) materials having a pH of 12 or more at a concentration of 1% in water and (2) organic chelating builders.

4,191,662
Y_2O_3:EU PHOSPHOR HAVING INCREASED BRIGHTNESS

James E. Mathers, and Ramon L. Yale, both of Ulster, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Sep. 13, 1978, Ser. No. 942,085
Int. Cl.[2] C09K 11/46
U.S. Cl. 252—301.4 R 2 Claims

1. A phosphor composition consisting essentially of $(Y_{1-x}Eu_x)_2O_3$, wherein x is within the range of about 0.01 to 0.10, and from about 100 to 800 parts per million of Mg as MgO, and exhibiting increased brightness upon cathode ray and UV excitation relative to said composition without Mg.

4,191,663
PREPARATION OF SHAPE SELECTIVE ZEOLITE ALPHA AS CATALYST

Günter H. Kühl, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 26, 1978, Ser. No. 900,850
Int. Cl.[2] B01J 29/06; C01B 33/28
U.S. Cl. 252—455 Z 45 Claims

1. A method for synthesizing crystalline aluminosilicate zeolite Alpha containing platinum-group metal within the zeolite pores which comprises the steps of preparing a reaction mixture containing sources of sodium oxide, tetramethylammonium oxide, aluminum oxide, silicon dioxide, a cationic platinum-group metal complex and water and having a composition, in terms of mole ratios of oxides, falling within the following ranges:

SiO_2/Al_2O_3	=	4.0–12.0
$H_2O/(Na_2O + R_2O)$	=	15.0–40.0
$(Na_2O + R_2O)/Al_2O_3$	=	2.0–7.0
$Na_2O/(Na_2O + R_2O)$	=	0.2–0.75
M/Al_2O_3	=	10^{-6}–0.06

wherein R is a tetramethylammonium cation and M is a platinum-group metal, aging said mixture for from about 2 hours to about 100 hours at a temperature of from about 10° C. to about 70° C., and then heating said mixture at a temperature of from about 80° C. to about 150° C. until crystals of said zeolite are formed.

4,191,664
THERMALLY STABLE NICKEL-ALUMINA CATALYSTS USEFUL FOR METHANATION AND OTHER REACTIONS

Dennis P. McArthur, Yorba Linda, Calif., assignor to Union Oil Company of California, Brea, Calif.

Continuation-in-part of Ser. No. 745,079, Nov. 26, 1976, abandoned, which is a continuation-in-part of Ser. No. 651,645, Jan. 23, 1976, Pat. No. 4,042,532, which is a continuation-in-part of Ser. No. 586,946, Jun. 16, 1975, abandoned. This application May 19, 1978, Ser. No. 907,804
The portion of the term of this patent subsequent to Aug. 16, 1994, has been disclaimed.
Int. Cl.[2] B01J 21/04, 23/74
U.S. Cl. 252—466 J 8 Claims

1. A thermally stable catalyst composition comprising a substantially homogeneous composite of between about 30 and 95 weight-percent of an alumina component and about 5 and 70 weight-percent of a nickel component calculated as NiO, said nickel component comprising radiation-detectable crystallites of nickel oxide and nickel aluminate, said catalyst having been prepared by the steps of:

(1) slurrying a powdered alumina hydrate in an aqueous solution of a nickel salt for a sufficient time to effect pore saturation of said alumina hydrate with said solution, wherein a sufficient amount of said nickel salt being in the form of an ammino complex with ammonia to provide at least 2 moles of ammino ligands per mole of said nickel salt;

(2) heating the resulting slurry with agitation at a temperature and for a time sufficient to bring about a gradual decomposition of substantially all of said ammino complex with resultant liberation of ammonia and precipitation of substantially all of said nickel salt to form the hydrated precursor of said nickel component intimately composited with said alumina hydrate; and

(3) drying and calcining the resulting composite at a temperature sufficiently high to convert said alumina hydrate to gamma alumina.

4,191,665
BARIUM TITANATE SEMICONDUCTOR CERAMIC COMPOSITIONS

Harufumi Mandai, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Sep. 13, 1978, Ser. No. 941,858
Claims priority, application Japan, Sep. 16, 1977, 52/111806
Int. Cl.[2] H01B 1/08; C04B 35/46
U.S. Cl. 252—520 1 Claim

1. The barium titanate semiconductor ceramic composition consisting essentially of the composition expressed by the general formula:

$$(Ba_{1-x-y-z}Ca_xHo_yMn_z)TiO_3$$

wherein x, y and z are respective mol fractions and have values in the following respective ranges:

$0.05 \leqq x \leqq 0.20$
$0.0030 \leqq y \leqq 0.0090$
$0.0010 \leqq z \leqq 0.0018$.

4,191,666
STABLE AQUEOUS EMULSIONS OF TRICHLOROTRIFLUOROETHANE AND METHOD

Pierre Chabert, Saint-Genis Laval, and Louis Foulletier, Oullins, both of France, assignors to Produits Chimiques Ugine Kuhlmann, France

Filed Jan. 9, 1976, Ser. No. 647,859
Claims priority, application France, Jan. 20, 1975, 75 01606
Int. Cl.[2] C11D 1/78; B01J 13/00
U.S. Cl. 252—545 8 Claims

1. A stable emulsion consisting essentially of from about

70% to 98.5% by weight of trichlorotrifluorethane, from about 1% to 20% by weight of water, and from about 0.5% to 10% by weight of a mixture of:

at least one hydrophilic amine phosphate ester selected from the group consisting of the neutralization product of:

(a) a phosphoric compound selected from a group consisting of monophosphoric, diphosphoric, and a mixture of monophosphoric and diphosphoric compounds of:

(i) straight or branched-chain aliphatic alcohols contained from 6 to 20 carbon atoms; or

(ii) ether alcohols obtained by the ethoxylation, by 1 to 5 moles of ethylene oxide, of an alkylphenol or of a straight or branched-chain aliphatic alcohol containing from 6 to 20 carbon atoms; and

(b) a hydrophilic, water-soluble amine selected from the group consisting of primary, secondary, and a mixture of such amines; and

at least one lipophilic phosphate ester selected from the group consisting of the neutralization product of (a) and a lipophilic amine;

said mixture of amine phosphate esters containing, by weight thereof, at least 5% by weight of the hydrophilic amine phosphate ester.

7. The method of cleaning an object comprising cleaning the object with the emulsion of claim 1.

4,191,667

BUILDING ELEMENTS AND THEIR PREPARATION

Felix Wehrmann, Vienna; René-Hagen Voelkl, Maria Enzersdorf, and Edwin Wojta, Aigen, all of Austria, assignors to Isovolta, Osterreichische Isolierstoffwerke Aktiengesellschaft, Wiener Neudorf, Austria

Filed Mar. 24, 1978, Ser. No. 890,015

Claims priority, application Austria, Mar. 25, 1977, 2084/77

Int. Cl.² C08J *11/00*

U.S. Cl. 260—2.3 **9 Claims**

1. An improved building material element having good mechanical properties comprising expanded vermiculite granules coated with 2 to 30% by weight, based on the weight of vermiculite, with an organic binder formed into a press cake which is then press heated to form the building element, the improvement comprising that the press cake is press heated to have a density of at least 600 kg/m^3 to form the building element, that the building element formed is trimmed, that the trimmed material is shredded to granular or powdered material, and that the granular or powdered material is recycled to comprise at least a portion of the coated vermiculite particles.

4,191,668

INDUCTION OF IMMUNOLOGICAL TOLERANCE

David H. Katz, LaJolla, Calif., assignor to Scripps Clinic and Research Foundation, La Jolla, Calif.

Filed Feb. 3, 1977, Ser. No. 764,586

Int. Cl.² C08L *89/00, 77/04*; A61K *39/00, 37/26*

U.S. Cl. 260—6 **4 Claims**

1. A therapeutic immunosuppressive agent capable of inducing specific immunological tolerance to an antigen by supression of antibody response, comprising a conjugate of D-glutamic acid:D-lysine copolymer and the antigen insulin.

4,191,669

POLYAMIDES

Adrién G. Hinze, Dordrecht, and Hendrik G. Stigter, Berkenwoude, both of Netherlands, assignors to Emery Industries, Inc., Cincinnati, Ohio

Filed Mar. 7, 1978, Ser. No. 884,446

Claims priority, application Netherlands, Mar. 7, 1977, 7702393

Int. Cl.² C08G *69/34*

U.S. Cl. 260—18 N **8 Claims**

1. A polyamide comprised of groups derived from a polymeric fatty acid containing 70% to 99% dimer acid and 90–110 mole percent of an amine component consisting of 10–100 mole percent triamine of the structure

$$H_2N-R_2-\underset{\displaystyle R_1}{\overset{\displaystyle |}{N}}-R_3-NH_2$$

wherein R_1 is an alkyl group having from 1–3 carbon atoms and R_2 and R_3 are the same or different bivalent hydrocarbon radicals together containing from 4 up to about 24 carbon atoms and 0–90 mole percent of a C_{2-20} diamine, said polyamide having an acid value less than 15 and amine value between about 10 and 125.

4,191,670

SURFACE-TREATED MINERAL FILLER

Dieter Strauch, Zofingen, and Rudiger Werner, Oftringen, both of Switzerland, assignors to Pluss-Staufer AG, Oftringen, Switzerland

Filed May 30, 1978, Ser. No. 910,997

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1977, 2727845

Int. Cl.² C08K *9/04*; C09D *3/74, 3/80*

U.S. Cl. 260—23 AR **35 Claims**

18. A watery paint system which contains a binder and a surface-treated mineral filler characterized by the fact that the filler is surface treated with a mixture of saturated and unsaturated aliphatic carboxylic fatty acids having from about 6 to about 22 carbon atoms, and wherein said mixture contains about 10 to about 35% by weight of said saturated acid and from about 65 to about 90% by weight of said unsaturated acid.

4,191,671

ABRASION RESISTANT RUBBER COMPOSITIONS

Nobuyuki Katsoka, Tokyo; Takuya Takahashi, Odawara; Fujio Ohkawa, Yokohama, and Shiro Anzai, Higashi-Murayama, all of Japan, assignors to Bridgestone Tire Company, Limited, Tokyo, Japan

Filed Apr. 7, 1977, Ser. No. 785,704

Claims priority, application Japan, Apr. 7, 1976, 51-38212

Int. Cl.² C08K *3/04, 5/09, 5/14*

U.S. Cl. 260—23.7 M **29 Claims**

1. An abrasion resistant rubber composition having improved mechanical properties and flexing fatigue resistance due to component (E) below, said composition prepared by heating and curing the mixture comprising

(A) a diene elastomer,

(B) an α,β-ethylencially unsaturated carboxylic acid, wherein the ratio by weight of the component (A) to the component (B) is 87/13 to 55/45,

(C) a divalent metal compound being present in quantities of 50 to 150 parts by weight per 100 parts by weight of the component (B),

(D) an organic peroxide being present in quantities of 0.3 to 5.0 parts by weight per 100 parts by weight of the combined weight of the components (A) and (B), and

(E) an unpolymerizable carboxylic acid or a metal salt of the unpolymerizable carboxylic acid being present in quantities of 1.5 to 17 parts by weight per 100 parts by weight of the component (A).

4,191,672

POLYMER AGGREGATES

Frederik Salome, and William T. Elliott, both of New South Wales, Australia, assignors to Berger Jenson & Nicholson Ltd., London, England

Filed Oct. 21, 1977, Ser. No. 844,486
Claims priority, application Australia, Oct. 25, 1976, PC7853; Mar. 21, 1977, PC9505
Int. Cl.[2] C08L 29/00
U.S. Cl. 260—29.6 PM 21 Claims

1. Substantially uniform, discrete polymer aggregates in the form of discrete particles of controlled particle size below 150 microns maximum dimension which are themselves aggregates of primary particles of a polymer or polymers derived from at least one ethylenically unsaturated monomer together with from 0 to about 400%, by weight on the weight of the monomer, of an organic thickener compatible with the monomer, said aggregate particles containing from 0 to about 95% by weight of pigment and/or extender and having been formed during polymerization of the monomer.

16. A coating composition comprising polymer aggregates as claimed in claim 1.

17. A coating composition as claimed in claim 16 in the form of a latex paint.

4,191,673

NON-BLOCKING COATING COMPOSITION

Dale C. Wiesman, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.

Division of Ser. No. 741,232, Nov. 12, 1976, Pat. No. 4,107,380. This application Jan. 16, 1978, Ser. No. 869,753
Int. Cl.[2] C08L 23/06
U.S. Cl. 260—29.6 XA 3 Claims

1. A non-blocking coating composition for application as an overcoating on the surface of a normally tacky coated flexible packaging sheet material, comprising an aqueous dispersion of between about 65 and 90 weight percent of an ethylene-vinyl acetate copolymer having a melt index between about 20 and 40 and a vinyl acetate content of between about 18 and 30%, said dispersion having suspended therein between about 10 and 35 weight percent, based on total solids content of the composition, of a solid, particulate polyethylene having a density between about 0.91 and 0.94 and an average particle size between about 20 and 50 microns.

4,191,674

ZWITTERION-CONTAINING COMPOSITIONS

Marco Wismer, Gibsonia, and Joseph F. Bosso, Lower Burrell, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 599,260, Jul. 25, 1975, Pat. No. 4,066,592, which is a division of Ser. No. 167,476, Jul. 29, 1971, Pat. No. 3,928,156, which is a continuation-in-part of Ser. No. 840,848, Jul. 10, 1969, abandoned. This application Oct. 25, 1977, Ser. No. 844,944
The portion of the term of this patent subsequent to Jan. 3, 1995, has been disclaimed.
Int. Cl.[2] C25D 13/06
U.S. Cl. 260—29.2 EP 6 Claims

1. An ungelled, inherently water-dispersible, substantially epoxy group-free, synthetic organic resin containing Zwitterions, said Zwitterions consisting of a quaternary ammonium base group and an acid anion, said organic resin being derived from an epoxy resinous material.

4,191,675

FIRE SPREADING INHIBITOR COMPOSITION

Yutaka Inagaki; Hironaga Matsubara, and Kojiro Ishise, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Mar. 16, 1977, Ser. No. 778,281
Claims priority, application Japan, Mar. 16, 1976, 51/28879
Int. Cl.[2] C09K 3/28
U.S. Cl. 260—29.3 7 Claims

1. A fire spreading inhibitor composition comprising about 20 to about 40% by weight of an emulsion of a synthetic resin, about 1 to about 15% by weight of infusible organic phenolic resin fibers which exhibit a fire spreading inhibition effect, about 20 to about 70% by weight of an inorganic powder at least about 50% of which is clay and/or zinc borate, and about 5 to 20% by weight of a halogenated hydrocarbon flame retardant, all percentages being based on the dry weight as a coating.

4,191,676

AUTODEPOSITION PROCESS AND COMPOSITION

Wilbur S. Hall, Plymouth Meeting, Pa., assignor to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 664,613, Mar. 8, 1976, abandoned, which is a continuation-in-part of Ser. No. 562,898, Mar. 27, 1975, abandoned. This application May 22, 1978, Ser. No. 907,902
Int. Cl.[2] C08L 9/08
U.S. Cl. 260—29.7 R 55 Claims

1. An acidic aqueous coating composition of the type which is effective in forming on a metallic surface immersed therein a resinous coating which increases in weight or thickness the longer said surface is immersed in said composition in the absence of any electrical charge on said metallic surface other than that which may be imparted thereto by said composition and characterized by the presence therein of resin particles which are:

(A) prepared by polymerizing (i) a conjugated diene, (ii) CH_2=CH—R wherein R is an aryl or cyano group, (iii) a vinylidene halide, and (iv) a monoethylenically unsaturated monomer having a functional group selected from the class consisting of amide and carboxyl groups; and/or

(B) substantially chemically and physically homogeneous, wherein the concentration of surfactant, if any, in the aqueous phase of said composition is below the critical micelle concentration.

4,191,677

SELF-LOCKING THREADED FASTENER PRODUCT

Norman S. Strand, Howell, Mich., assignor to Federal Screw Works, Detroit, Mich.

Filed Oct. 21, 1977, Ser. No. 844,201
Int. Cl.[2] C08L 63/00; F16B 39/22
U.S. Cl. 260—37 EP 24 Claims

1. A self-locking threaded fastener means having a patch on the threaded portion thereof to provide said self-locking properties, said patch comprising a cured thermoplastic epoxy adhesive which has been mixed together off the fastener means and applied to said fastener in an unpolymerized state and allowed to polymerize to a thermoplastic polymer on said fastener.

4,191,678

FIRE RETARDANT POLYESTER-POLYTETRAFLUOROETHYLENE COMPOSITIONS

Clive P. Smith, Wheathampstead, England, assignor to Imperial Chemical Industries Limited, United Kingdom

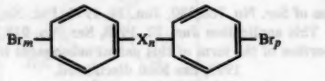
Continuation of Ser. No. 668,689, Mar. 19, 1976, abandoned. This application Aug. 24, 1977, Ser. No. 827,337

Claims priority, application United Kingdom, Apr. 10, 1975, 14792/75

Int. Cl.² C08L *67/06, 67/00*

U.S. Cl. 260—40 R **11 Claims**

1. A method of producing a thermoplastic polyester composition comprising mixing a normally flammable thermoplastic polyester, an effective amount of fire-retardant additives selected from the group consisting of compounds of the formula



where X may be —O—, —S—, —SO—, —SO_2—and —CH_2—, n may be 0 or 1 and each of m and p may be from 1 to 5 and polytetrafluoroethylene in the form of an aqueous colloidal dispersion, subjecting the mixture to conditions under which the polyester becomes molten and removing volatile materials from the melt, so that there is produced a composition which has a rating of 94VO according to underwriter's laboratory's test standard UL94 when measured on a sample of 1/16" thickness and which is non-dripping.

4,191,679

PHOTOGRAPHIC POLYESTER FILM SUPPORT

Tsutomu Okita; Masami Satou; Noburo Hibino, all of Fujinomiya; Kazunobu Katoh, and Masatoshi Sugiyama, both of Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

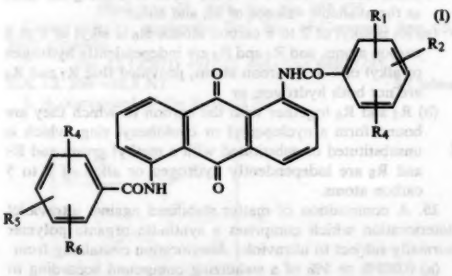
Filed Aug. 30, 1978, Ser. No. 938,161

Claims priority, application Japan, Aug. 31, 1977, 52/104400

Int. Cl.² C08K *5/08*; G03C *1/84*

U.S. Cl. 260—40 R **13 Claims**

1. A photographic polyester film support providing reduced halation and light-piping dyed with (a) a dye having a main absorption peak in the wavelength range of about 530 to about 570 nm, (b) a dye having a main absorption peak in the wavelength range of about 640 to about 680 nm, and (c) a dye having a main absorption peak in the wavelength range of about 420 to about 460 nm and represented by the formula (I):



(I)

wherein R_1, R_2, R_3, R_4, R_5 and R_6, which may be the same or different, each represents —H, —OH, —NH_2, —NHR_7, —NR_7R_8, —Cl, —Br, an alkyl group having 4 or less carbon atoms or an alkoxy group having 4 or less carbon atoms; and R_7 and R_8, which may be the same or different, each represents an alkyl group having 4 or less carbon atoms or an aryl group.

4,191,680

PROCESS FOR THE MANUFACTURE OF CONCENTRATED FORMULATIONS

Jacques Wegmann, Bettingen, and Hans D. Kirner, Pratteln, both of Switzerland, assignors to Rohner AG Pratteln, Pratteln, Switzerland

Filed Jul. 11, 1978, Ser. No. 923,655

Claims priority, application Switzerland, Jul. 11, 1977, 8541/77

Int. Cl.² C08J *3/20*

U.S. Cl. 260—42 **14 Claims**

1. A process for the manufacture of aqueous and/or organic dispersible, free-flowing, and low-dusting concentrated formulations in powder or granular form of at least one ingredient which is sparingly soluble or insoluble in water, comprising the steps of:

(i) mechanically and/or chemically comminuting said ingredient in an aqueous medium, in the presence of a grinding auxiliary comprising a dissolved, water soluble salt of an acid resin, until a mean particle size of less than 5 μm is reached;

(ii) forming a two-phase system with said aqueous medium by adding, during or after comminution, at least one organic solvent which has a limited solubility, of at least 1% to 50%, in the aqueous medium;

(iii) turbulently mixing the resulting two-phase system with at least one sparingly water-soluble, or water-insoluble, high-molecular carrier;

(iv) reducing the volume of the organic phase, said organic phase containing said carrier and said ingredient by adding further water, until the formulation particles formed are no longer tacky;

(v) separating off said formulation particles; and

(vi) rinsing off with water said separated particles.

4,191,681

MELT PROCESSABLE WHOLLY AROMATIC POLYESTER COMPOSITION CONTAINING A PHOSPHORUS ESTER

Robert W. Stackman, Morristown, and Edward J. Kuczynski, Westfield, both of N.J., assignors to Celanese Corporation, New York, N.Y.

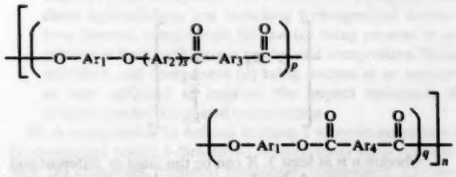
Filed Nov. 17, 1977, Ser. No. 852,384

Int. Cl.² C08L *67/02, 67/04*

U.S. Cl. 260—45.7 P **54 Claims**

1. An improved melt processable wholly aromatic polyester composition which comprises in intimate admixture:

I. from about 95 to about 60 percent by weight of said composition of a normally non-melt processable wholly aromatic polyester having a recurring structural formula:



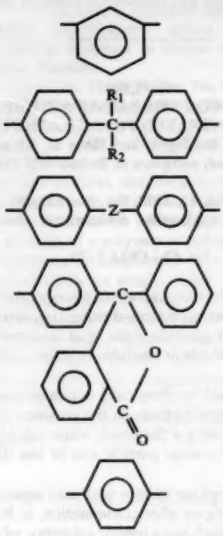
wherein n is an integer of at least 10, Ar_1 is a divalent alcohol derived moiety selected from the group consisting of

(a)

(b)

(c)

(d)

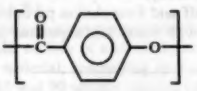


(e)

and mixtures thereof,

wherein R_1 and R_2 which may be the same or different represent hydrogen, a lower alkyl group or together constitute a cyclic hydrocarbon group and Z is selected from the group consisting of sulfide, sulfone, oxy and carbonyl;

Ar_2 is the p-hydroxy benzoic acid derived moiety

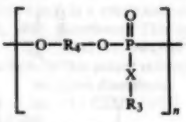


which when present is accompanied by substantially equimolar amounts of the divalent moiety Ar_1 and the acid derived moiety as represented by Ar_3 and Ar_4 collectively;

Ar_3 consists essentially of an aromatic dicarboxylic acid-derived moiety selected from the group consisting of m-phenylene, p-phenylene and naphthylene and mixtures thereof;

Ar_4 is p-phenylene; and wherein s is 0 or 1, p is at least 1, q is zero when Ar_3 is other than naphthylene and q is at least 1 when Ar_3 is naphthylene with the ratio of p and q being sufficient to yield a normally non-melt processable wholly aromatic polyester;

and (II) from about 5 to about 40 percent by weight of the total composition of a phosphorus ester having the recurring structural formula:



wherein n is at least 3, X can be the same or different and represent a single bond, oxy and sulfide, R_3 can be the same or different and represent arylene, alkylene and haloarylene and mixtures thereof.

4,191,682

HINDERED PIPERIDINE CARBOXYLIC ACIDS, METAL SALTS THEREOF AND STABILIZED COMPOSITIONS

Chester E. Ramey, Spring Valley, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

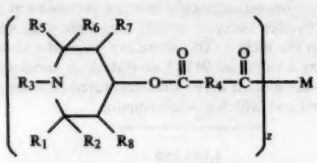
Division of Ser. No. 700,380, Jun. 28, 1976, Pat. No. 4,116,933. This application Jun. 22, 1978, Ser. No. 918,211

The portion of the term of this patent subsequent to Nov. 18, 1992, has been disclaimed.

Int. Cl.[2] C08K 5/34; C07D 211/46

U.S. Cl. 260—45.8 N **17 Claims**

1. A compound of the formula



I

wherein

R_1 and R_2 independently of each other are straight- or branched-chain alkyl having from 1 to 6 carbon atoms, or together with the carbon to which they are bound form a cyclopentyl or cyclohexyl ring, which is unsubstituted or substituted with a methyl group,

R_3 is hydrogen, alkyl having 1 to 12 carbon atoms β-methoxyethyl, alkenyl having 3 to 4 carbon atoms, propargyl, benzyl, benzyl substituted by 1 or 2 methyl groups or alkanoyl containing 1 to 18 carbon atoms.

R_4 is straight- or branched-chain alkylene having 1 to 8 carbon atoms, or the group $-(CH_2)_mY(CH_2)_n-$ wherein Y is oxygen or sulfur and m and n independently of each other are an integer from 1 to 3,

M is hydrogen or metal selected from the group consisting of barium, calcium, magnesium, sodium, potassium,

Z has a value of from 1 to 4, the value of Z being the same as the available valence of M, and either

(a) R_5 is alkyl of 2 to 6 carbon atoms, R_6 is alkyl of 1 to 6 carbon atoms, and R_7 and R_8 are independently hydrogen or alkyl of 1 to 5 carbon atoms, provided that R_7 and R_8 are not both hydrogen, or

(b) R_5 and R_6 together with the carbon to which they are bound form a cyclopentyl or cyclohexyl ring, which is unsubstituted or substituted with a methyl group and R_7 and R_8 are independently hydrogen or alkyl of 1 to 5 carbon atoms.

15. A composition of matter stabilized against ultraviolet deterioration which comprises a synthetic organic polymer normally subject to ultraviolet deterioration containing from

(a) 0.005% to 5% of a stabilizing compound according to claim 1,

(b) 0 to 5% of a phenolic antioxidant,

(c) 0 to 5% of a thio co-stabilizer, and

(d) 0 to 5% of a U.V. absorber.

4,191,683
DERIVATIVES OF 4-AMINOPIPERIDINE AS STABILIZERS FOR POLYMERS

Heimo Brunetti, Reinach; Jean Rody, Basel, both of Switzerland; Nobuo Soma, and Tomoyuki Kurumada, both of Tokyo, Japan, assignors to Ciba-Geigy Corporation, Ardsley, N.Y. and Sankyo Company Limited, Tokyo, Japan

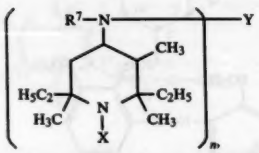
Continuation-in-part of Ser. No. 687,826, May 19, 1976, abandoned. This application Nov. 21, 1977, Ser. No. 853,658

Claims priority, application United Kingdom, May 28, 1975, 23226/75

Int. Cl.[2] C08K *5/34;* **C07D** *211/56, 211/92*

U.S. Cl. 260—45.8 N **13 Claims**

1. A compound of the formula



(I)

a mixture of isomers thereof, or an acid addition salt thereof wherein n is 1 to 3 X is hydrogen, methyl, benzyl, aliphatic acyl having 1 to 4 carbon atoms or 2-hydroxyethyl, R^7 is hydrogen, alkyl having 1 to 12 carbon atoms benzyl, or, if n is 2 and Y is alkylene having 2 to 10 carbon atoms, R^7 is hydrogen or acetyl, Y, if n is 1, represents hydrogen, $—CH_2CH_2OH$, —CO—R^{13} wherein R^{13} is hydrogen, alkyl having 1 to 7 carbon atoms, alkenyl having 2 or 3 carbon atoms or phenyl, —CONH-R^{15} wherein R^{15} is alkyl having 1 to 18 carbon atoms or phenyl, $—SO_2R^{16}$ wherein R^{16} is methyl, phenyl or parymethylphenyl, —CO—R^{12}—COOH wherein R^{12} is $—CH_2CH_2—$, —CH=CH— or o-phenylene, or Y and R^7 together with the N-atom to which they are attached form a succinimide, maleimide or phthalimide ring, if n is 2, Y represents —CO—, —CO—CO—, —CO—R^{18}—CO— wherein R^{18} is alkylene having 1 to 8 carbon atoms or phenylene or —CONH—R^{19}—NHCO— wherein R^{19} is alkylene having 2 to 6 carbon or tolylene, and if R^7 is hydrogen or acetyl, Y may also be alkylene having 2 to 6 carbon atoms, and, if n is 3, Y represents the 1,3,5-triazine-2,4,6-triyl residue.

7. A compound as claimed in claim 1 which is N,N'-bis-(2,6-diethyl-2,3,6-trimethyl-4-piperidyl)-hexamethylenediamine.

4,191,684
UREA DERIVATIVES, THEIR PREPARATION, AND THEIR USE AS LIGHT STABILIZERS

Hartmut Wiezer, Gersthofen; Gerhard Pfahler, Augsburg; Norbert Mayer, and Harald Knorr, both of Gersthofen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

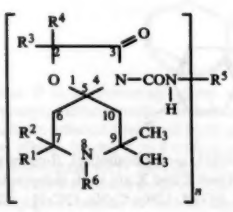
Filed Aug. 21, 1978, Ser. No. 935,470

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1977, 2738340

Int. Cl.[2] C07D *491/10, 491/20;* **C08K** *5/35*

U.S. Cl. 260—48.5 NT **5 Claims**

1. A compound of the formula (I)



I

in which

R^1 and R^2, being identical or different, each are linear or branched alkyl having from 1 to 12 carbon atoms, or R^1 and R^2 together with the carbon atom to which they are linked form a cyclopentane or cyclohexane ring which may also be methyl-substituted or a 2,2,6,6-tetramethylpiperidine ring the carbon atom 4 of which is identical with the carbon atom 7 of the spirodecane system;

R^3 is hydrogen, alkyl or isoalkyl having from 1 to 30 carbon atoms, or phenylalkyl having from 7 to 10 carbon atoms, the aliphatic chain having from 1 to 4 carbon atoms;

R^4 is hydrogen, alkyl having from 1 to 30 carbon atoms, phenyl or naphthyl, which may be substituted by a halogen atom, or alkyl radical having from 1 to 4 carbon atoms, or phenylalkyl having from 7 to 10 carbon atoms, the aliphatic chain containing from 1 to 4 of the latter carbon atoms; or

R^3 and R^4 together with the carbon atom linking them form a cycloalkane ring having from 4 to 20 carbon atoms;

R^5, when n is 1, is alkyl having from 1 to 20 carbon atoms, alkenyl having from 3 to 18 carbon atoms, cycloalkyl having from 5 to 12 carbon atoms, which may be substituted by C_1–C_4-alkyl phenyl or naphthyl which may be substituted by a chlorine atom or alkyl having from 1 to 18 carbon atoms, or phenylalkyl having from 7 to 18 carbon atoms, the aryl ring containing 6 carbon atoms;

R^5, when n is 2, is linear or branched alkylene having from 2 to 20 carbon atoms, phenylene or naphthylene which may be substituted by C_1–C_4-alkyl, or phenylalkylene having from 7 to 18 carbon atoms; and

R^6 is hydrogen, oxygen, hydroxyl or alkyl having from 1 to 4 carbon atoms.

4. Process for stablizing halogen-free aliphatic alpha-olefin homo- and copolymers and chlorine-containing vinyl homo- and copolymers against the damaging influence of light, wherein 0.01 to 5 parts by weight, based on the polymer, of a compound of claim 1 or a salt thereof with an inorganic or organic acid, is added to the polymers.

4,191,685
COMPOSITION OF POLYPHENYLENE ETHER, AROMATIC PHOSPHATE, AROMATIC HALOGEN COMPOUND AND IMPACT MODIFIER COMPRISING DIENE POLYMER

William R. Haaf, Voorheesville, and Gim F. Lee, Jr., Albany, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Oct. 3, 1977, Ser. No. 838,861

Int. Cl.[2] C08K *5/02, 5/13;* **C08L** *53/02*

U.S. Cl. 260—45.95 G **17 Claims**

1. A flame retardant, impact resistant thermoplastic composition comprising

(a) a polyphenylene ether resin;

(b) an aromatic phosphate, aromatic phosphonate or aromatic phosphine oxide compound;

(c) an aromatic halogen compound; and

(d) an impact modifier comprising an elastomeric A-B-A or A-B block copolymer wherein A comprises a polymerized vinyl aromatic compound and B comprises a polymerized diene hydrocarbon, not including hydrogenated derivatives thereof, components (b) and (c) being present in an amount at least sufficient to render said composition flame retardant, and component (d) being present in an amount at least sufficient to improve the impact resistance of articles molded from said composition.

17. A composition as defined in claim 1 wherein component (a) comprises poly(2,6-dimethyl-1,4-phenylene) ether; component (b) comprises triphenyl phosphate; component (c) comprises decabromodiphenyl oxide; and compound (d) comprises an A-B-A block copolymer including polystyrene terminal blocks and polybutadiene center blocks.

4,191,686
PROCESS FOR PREPARING FIBER-REACTIVE PHTHALOCYANINE AZO DYES

Rolf Muller, Karben, and Joachim Ribka, Offenbach, both of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, 6 Frankfurt(Main)-Fechenheim, Fed. Rep. of Germany

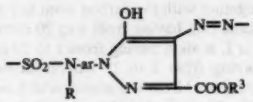
Filed Apr. 12, 1977, Ser. No. 786,819

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1976, 2617062; Apr. 17, 1976, 2617087; Apr. 17, 1976, 2617126

Int. Cl.[2] C09B *62/02, 62/44*

U.S. Cl. 260—147 7 Claims

1. A process of preparing a water-soluble fiber-reactive phthalocyanine azo dye in which the phthalocyanine nucleus carries at least one group having the structure

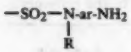


where

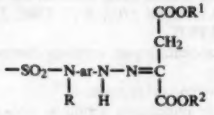
R is hydrogen or alkyl having up to 6 carbons, and

ar is a carbocylic divalent aromatic or araliphatic group containing up to two benzene rings and up to 16 carbons, a benzene ring carrying the nitrogen of the heterocycle and R^3 is hydrogen or hydrocarbyl having up to 18 carbons

the process comprising reacting a water-soluble phthalocyanine dye in which the nucleus has a sulphonyl halide group with an ar-diamine to form a



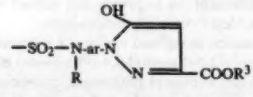
product, diazotizing said product and coupling the diazonium compound with a aryl-succinic acid ester to yield the configuration



where

R^1 is hydrocarbyl having up to 18 carbons, and

R^2 is hydrocarbyl having up to 18 carbons, and then cyclizing at sufficiently high pH that configuration to the desired pyrazolone structure



followed by coupling the pyrazolone ring with another diazonium compound carrying the fiber-reactive group.

4,191,687
REACTIVE DYESTUFFS CONTAINING THE RESIDUE OF 1-HYDROXY-7-AMINO-8-(5'-AMINO-2',4'-DISULPHOPHENYLAZO)NAPHTHALENE-3,6-DISULPHONIC ACID

Peter W. Austin, Manchester, England, assignor to Imperial Chemical Industries Limited, England

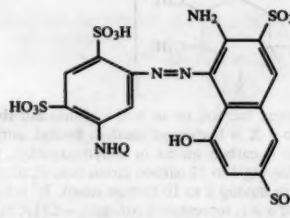
Filed Mar. 16, 1978, Ser. No. 887,338

Claims priority, application United Kingdom, Jun. 8, 1977, 23909/77

Int. Cl.[2] C09B *62/08, 62/16, 62/24, 62/40*

U.S. Cl. 260—153 3 Claims

1. A reactive dyestuff of the formula:



(1)

wherein Q represents a cellulose reactive group selected from

dichloro-5-cyanopyrimidinyl

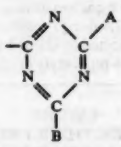
dichloro-5-nitropyrimidinyl

trichloropyrimidinyl

difluoro-5-chloropyrimidinyl

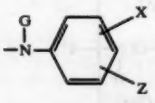
difluoro-5-cyanopyrimidinyl and

triazinyl groups of the formula:



where A is selected from F, Br and Cl

B is selected from F, Br, Cl, C_{1-4} alkoxy C_{1-4} alkoxy, phenoxy, sulphophenoxy, C_{1-4} alkylamino, C_{1-4} alkylamino in which the C_{1-4} alkyl is substituted by SO_3H, OH or CN; di(C_{1-4} alkyl) amino, di(C_{1-4} alkyl) amino in which one or both the C_{1-4} alkyl substituted by SO_3H, OH or CN; cyclohexylamino, morpholino, piperazino, mono-, di-, trisulphonaphthylamino or a group of the formula:



(2)

where G = H, methyl, ethyl, ω-sulphomethyl, β-carboxy-β-hydroxy- or β-cyanoethyl and Z and X are each independently selected from H, COOH, SO_3H, CH_3, C_2H_5, OC_2H_5, Cl, Br, CN, NO_2, $NHCOCH_3$.

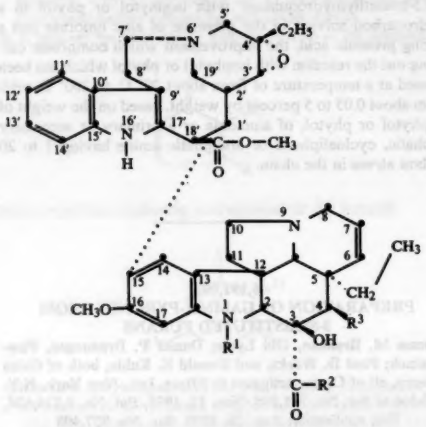
4,191,688
AMIDES OF LEUROSINE, LEUROFORMINE, DESACETYLLEUROSINE AND DESACETYLLEUROFORMINE

Robert A. Conrad, Indianapolis; George J. Cullinan, Trafalger; Jean C. Miller, and Koert Gerzon, both of Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 822,464, Aug. 8, 1977, abandoned. This application Jun. 12, 1978, Ser. No. 914,695
Int. Cl.[2] C07D *519/04*
U.S. Cl. 260—244.4 6 Claims

1. A compound of the formula:

II



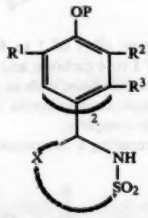
wherein R^1 is CH_3 or CHO; R^2 is NH_2, NH—CH_3, or NH—CH_2—CH_2—X, wherein X is OH or SY wherein Y is CH_3 or a bond, said bond joining two moieties of the above formula thru the C-3 carboxamido group when R^2 is NH—CH_2—CH_2—X, X is SY and Y is a bond; and R^3 is OH; and pharmaceutically-acceptable acid addition salts thereof.

4,191,689
BENZISOTHIAZOLE-1,1-DIOXIDE AND NAPHTHO-1,2-THIAZINE-1,1-DIOXIDE COMPOUNDS

Stanley M. Bloom, Waban; Alan L. Borror, Lexington, and James W. Foley, Andover, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 23, 1977, Ser. No. 836,004
Int. Cl.[2] C07D *275/06*; C07F *7/18*; C07D *279/02*
U.S. Cl. 548—207 12 Claims

1. A compound of the formula



wherein P is a protecting group selected from 2'-tetrahydropyranyl, methoxymethyl and dimethyl-t-butylsilyl, R^1 and R^2 each are selected from hydrogen, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, chloro and fluoro; R^3 is hydrogen, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, or -OP wherein P has the same meaning given above; R^2 and R^3 taken together represent the carbon atoms necessary to complete a fused benzene ring; and X represents the atoms necessary to complete 2,3-dihydrobenz[d]isothiazole-1,1-dioxide or 2,3-dihydronaphtho[1,8-de]1,2-thiazine-1,1-dioxide.

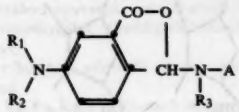
4,191,690
SUBSTITUTED 3,6-DIAMINOPHTHALIDES

Peter Burri, Reinach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 15, 1978, Ser. No. 942,840
Claims priority, application Switzerland, Feb. 10, 1978, 1513/78
Int. Cl.[2] C07D *307/83*
U.S. Cl. 260—343.3 R 7 Claims

1. A substituted 3,6-diaminophthalide of the formula

(I)



wherein R_1 represents hydrogen, alkyl of not more than 12 carbon atoms which is unsubstituted or substituted by halogen, hydroxyl, cyano or lower alkoxy, or represents cyclopentyl, cyclohexyl, benzyl, or benzyl which is substituted by halogen, lower alkyl or lower alkoxy,

R_2 represents alkyl of not more than 12 carbon atoms which is unsubstituted or substituted by halogen, hydroxyl, cyano or lower alkoxy, or represents cyclopentyl, cyclohexyl, benzyl, or benzyl which is substituted by halogen, lower alkyl or lower alkoxy and

R_3 represents alkyl of not more than 12 carbon atoms which is unsubstituted or substituted by halogen, hydroxyl, cyano or lower alkoxy, or represents cyclopentyl, cyclohexyl, phenyl, benzyl, or benzyl which is substituted by halogen, lower alkyl or lower alkoxy, or

R_1 and R_2, together with the nitrogen atom to which they are attached, represent a saturated 5- or 6- membered heterocyclic radical selected from the group consisting of pyrrolidino, piperidino, pipecolino, morpholino, thiomorpholino or piperazino, and

A represents phenyl or phenyl substituted by halogen, nitro, cyano, trifluoromethyl, lower alkyl, lower alkoxy, lower alkoxycarbonyl, phenyl, phenoxy, di-(lower alkyl)amino, lower alkylcarbonyl, benzoyl, lower alkyl-sulfonyl, phenylsulfonyl, phenylamino, diphenylamino, N-lower alkyl-N-phenylamino, di-(lower alkyl)aminosulfonyl, di-(lower alkyl)aminocarbonyl, phenylaminosulfonyl or phenylaminocarbonyl, or

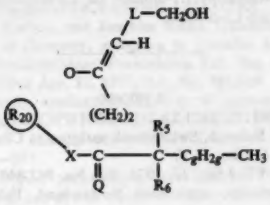
A represents naphthyl which is unsubstituted or substituted by halogen, cyano, nitro, lower alkyl or lower alkoxy.

4,191,691
ENLARGED-HETERO-RING PROSTACYCLIN ANALOGS

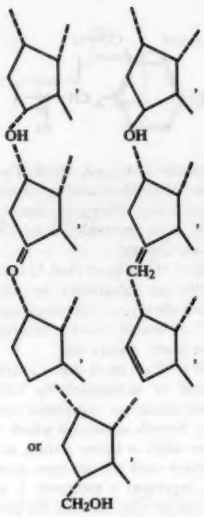
Roy A. Johnson, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 819,856, Jul. 28, 1977, Pat. No. 4,123,441, which is a continuation-in-part of Ser. No. 725,546, Sep. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 716,960, Aug. 23, 1976, abandoned. This application Aug. 11, 1978, Ser. No. 932,961
Int. Cl.[2] C07D *311/02*
U.S. Cl. 260—345.2 14 Claims

1. A 4Z compound of the formula



wherein is



wherein L is $-(CH_2)_d-C(R_2)_2-$

wherein d is zero to 5, R_2 is hydrogen, methyl, or fluoro, being the same or different with the proviso that one R_2 is not methyl when the other is fluoro,

wherein Q is

wherein R_8 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,

wherein C_gH_{2g} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between $-CR_5R_6-$ and terminal methyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro; and

wherein X is

(1) trans—CH=CH—

(2) cis—CH=CH—

(3) —C≡C—

(4) $-CH_2CH_2-$;

including the lower alkanoates thereof.

4,191,692

MANUFACTURE OF TOCOPHEROL

Paul Grafen, Weisenheim; Henning Kroesche, Frankenthal; Bernhard Schulz, Schwetzingen; Joachim Paust, Neuhofen, and Sigberg Pfohl, Speyer, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 763,646, Jan. 28, 1977, abandoned. This application Apr. 14, 1978, Ser. No. 896,479

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1976, 2606830

Int. Cl.[2] C07D *311/72*

U.S. Cl. 260—345.5 **13 Claims**

1. In a process for the manufacture of tocopherol by reacting 2,3,5-trimethylhydroquinone with isophytol or phytol in a hydrocarbon solvent in the presence of zinc chloride and a strong protonic acid, the improvement which comprises: carrying out the reaction with isophytol or phytol which has been treated at a temperature of from about 20° C. to 200° C. with from about 0.05 to 5 percent by weight, based on the weight of isophytol or phytol, of ammonia or a primary or secondary aliphatic, cycloaliphatic or araliphatic amine having 1 to 20 carbon atoms in the chain.

4,191,693

PREPARATION OF GAMMA-PYRONES FROM 3-SUBSTITUTED FURANS

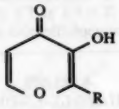
Thomas M. Brennan, Old Lyme; Daniel P. Brannegan, Pawcatuck; Paul D. Weeks, and Donald E. Kuhla, both of Gales Ferry, all of Conn., assignors to Pfizer, Inc., New York, N.Y.

Division of Ser. No. 741,348, Nov. 12, 1976, Pat. No. 4,126,624. This application Aug. 28, 1978, Ser. No. 937,408

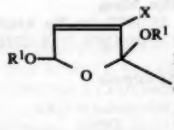
Int. Cl.[2] C07D *309/22*

U.S. Cl. 260—345.9 R **10 Claims**

1. A process for preparing a gamma-pyrone of the formula

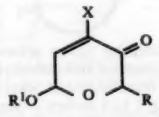


which comprises contacting a compound of the formula

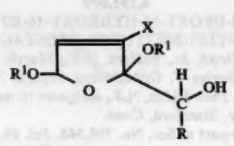


wherein R is hydrogen, alkyl of 1 to 4 carbons, phenyl or benzyl; R^1 is alkyl of 1 to 4 carbons; and X is chloro, bromo, iodo or alkoxyl of 1 to 4 carbons, with an acid having a pKa of about 5 or below until conversion to the desired gamma-pyrone is substantially complete.

8. A process for preparing a compound of the formula

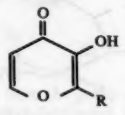


which comprises contacting a 3-substituted-2,5-dialkoxy-furfuryl alcohol of the formula

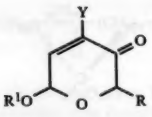


wherein R is hydrogen, alkyl of 1 to 4 carbon atoms, phenyl or benzyl; R^1 is alkyl of 1 to 4 carbon atoms; and X is chloride, bromide, iodide or alkoxyl of 1 to 4 carbon atoms, with acid in non-aqueous solution at a temperature between −50° C. and about 25° C. and separating said compound before substantial hydrolysis occurs.

9. A process for preparing a gamma-pyrone of the formula



which comprises contacting a compound of the formula



wherein R is hydrogen, alkyl of 1 to 4 carbon atoms, phenyl or benzyl; R^1 is hydrogen or alkyl of 1 to 4 carbon atoms; and Y is alkoxyl of 1 to 4 carbon atoms, with acid until conversion to the desired gamma-pyrone is substantially complete.

4,191,694

PROSTAGLANDIN-I_2 DERIVATIVES

Werner Skuballa; Bernd Radüchel; Norbert Schwarz; Helmut Vorbrüggen; Bernd Müller; Gerda Mannesmann; Olaf Loge; Ekkehardt Schillinger, and Jorge Casals-Stenzel, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

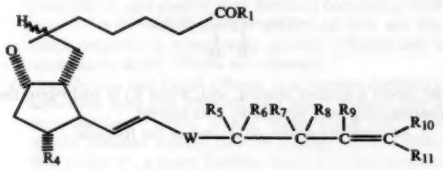
Filed Jul. 26, 1978, Ser. No. 928,126

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1977, 2734791

Int. Cl.² C07D *307/93;* A61K *31/34*

U.S. Cl. 260—346.22 **60 Claims**

1. A prostane derivative of the formula



wherein

R_1 is OR_2 or NHR_3;

R_2 is hydrogen; C_{1-10} alkyl; C_{1-10} alkyl substituted by 1–3 of (a) halogen, (b) C_{1-4} alkoxy, (c) C_{6-10} aryl, (d) C_{6-10} aryl substituted by 1–3 halogen atoms, phenyl, 1–3 C_{1-4} alkyl groups, chloromethyl, fluoromethyl, trifluoromethyl, carboxyl, hydroxy or C_{1-4} alkoxy, (e) di-C_{1-4}-alkyl amino or (f) tri-C_{1-4}-alkyl ammonium; C_{4-10} cycloalkyl; C_{4-10} cycloalkyl substituted by C_{1-4} alkyl, the total number of C-atoms being 4–10; C_{6-10} aryl; C_{6-10} aryl substituted by 1–3 halogen atoms, phenyl, 1–3 C_{1-4} alkyl groups, chloromethyl, fluoromethyl, trifluoromethyl, carboxyl, hydroxy or C_{1-4} alkoxy; or a 5 or 6 membered heterocyclic ring having one hetero atom selected from O, N and S;

R_3 is the acyl residue of a hydrocarbon carboxylic or sulfonic acid of 1–15 carbon atoms;

W is (a) an OH-substituted methylene group, (b) a

wherein the OH-groups in (a) or (b) can be in the α- or β-position, or (c) such a group wherein the H atom of the OH group is replaced by the acyl residue of a hydrocarbon carboxylic or sulfonic acid of 1–15 carbon atoms or by a conventional etherifying OH-blocking group selected from tetrahydropyranyl, tetrahydrofuranyl, α-ethoxyethyl, trimethylsilyl, dimethyl-tert-butylsilyl and tri-p-benzylsilyl;

R_4 is OH or hydroxy whose H atom is replaced as defined for W; and

R_5, R_6, R_7, R_8, R_9, R_{10} and R_{11} each independently is hydrogen or alkyl of 1–5 carbon atoms; or R_9 and R_{10} together represent a direct bond; and when R_{11} is alkyl, R_{10} can also be chlorine;

and for a derivative wherein R_2 is hydrogen, the salts thereof with physiologically compatible bases.

55. A pharmaceutical composition comprising an amount of a compound of claim 1 effective to lower blood pressure and a pharmaceutically acceptable carrier.

4,191,695

PROCESS FOR OBTAINING MALEIC ACID ANHYDRIDE

Amleto Neri; Sergio Sanchioni, both of Bergamo, and Carlo Nava, Scanzorosciate, all of Italy, assignors to Lonza Ltd., Gampel, Switzerland

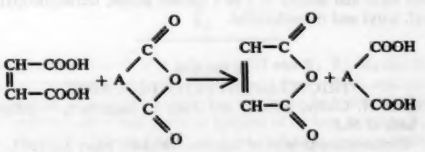
Filed Apr. 12, 1977, Ser. No. 786,764

Claims priority, application Switzerland, Apr. 12, 1976, 4592/76

Int. Cl.² C07D *307/60*

U.S. Cl. 260—346.76 **33 Claims**

1. A process for preparing maleic acid anhydride which comprises: (1) obtaining an aqueous maleic acid solution by washing the reaction gases from the gas phase oxidation of at least one organic compound having at least 4 carbon atoms with water; (ii) removing the water from the aqueous maleic acid solution, maleic acid resulting; (iii) the step which consists of dehydrating the maleic acid to maleic acid anhydride in the presence of an organic carboxylic acid anhydride, there being a H_2O exchange between the maleic acid and the organic carboxylic acid anhydride according to the following formula:



wherein A is two monovalent organic radicals or one divalent organic radical, the dehydration reaction taking place at a temperature between 100° and 130° C., and there being present from one mole to 3 moles of organic carboxylic acid anhydride per mole of maleic acid, and (iv) isolating the maleic acid anhydride, said isolation being achieved by centrifugation or

filtration when the organic carboxylic acid anhydride or step (iii) is an organic dicarboxylic acid anhydride and said isolation being achieved by fractional distillation when the organic carboxylic acid anhydride of step (iii) is an organic monocarboxylic acid anhydride.

4,191,696

OXIDATION PROCESS USING METAL NITRO COMPLEX

Benjamin S. Tovrog, Parsippany; Steven E. Diamond, Randolph, and Frank Mares, Whippany, all of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Jul. 24, 1978, Ser. No. 927,194
Int. Cl.[2] C07C *5/48, 27/12, 29/02, 45/16*
U.S. Cl. 260—348.33 **11 Claims**

1. In a process of oxidizing an oxidizable substrate in liquid phase using molecular oxygen as the oxygen source, the improvement which comprises providing in the oxidation reaction mixture a transition metal nitro complex, representable by the general formula $M(L_4)BNO_2$ wherein M is a transition metal, L_4 is any combination of monodentate, bidentate, tridentate, and tetradentate ligands, such as to provide four bonding sites, B being a monodentate base ligand and NO_2 being the nitro ligand —N(=O)O, under conditions such that the nitro ligand of said complex can oxidize the substrate and thus be reduced to a nitrosyl ligand; and establishing conditions such that such nitrosyl ligand can be reoxidized by molecular oxygen to nitro ligand.

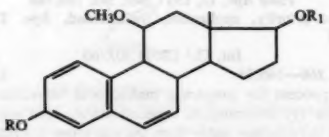
4,191,697

NOVEL STEROIDS

Alain Jouquey; Jean-Pierre Raynaud, and Jean Salmon, all of Paris, France, assignors to Roussel Uclaf, Paris, France

Filed Jun. 15, 1978, Ser. No. 915,601
Claims priority, application France, Jun. 27, 1977, 77 19613
Int. Cl.[2] C07J *1/00*
U.S. Cl. 260—397.5 **5 Claims**

1. A compound of the formula



wherein R is selected from the group consisting of hydrogen, acyl of an alkanoic acid of 1 to 5 carbon atoms, benzoyl, benzoyl substituted with at least one member of the group consisting of halogen, $—CF_3$ and alkyl and alkoxy of 1 to 5 carbon atoms, tetrahydropyranyl, trityl and trimethylsilyl and R_1 is selected from the group consisting of acyl of an alkanoic acid of 1 to 5 carbon atoms, benzoyl, benzoyl substituted with at least one member of the group consisting of halogen, $—CF_3$ and alkyl and alkoxy of 1 to 5 carbon atoms, tetrahydropyranyl, trityl and trimethylsilyl.

4,191,698

TRICYCLOPENTYLTIN FLUORIDE

Melvin H. Gitlitz, Edison, and John E. Engelhart, Westfield, both of N.J.

Continuation-in-part of Ser. No. 780,049, Mar. 22, 1977, abandoned, which is a continuation-in-part of Ser. No. 715,114, Aug. 17, 1976, abandoned. This application Nov. 21, 1977, Ser. No. 853,338
Int. Cl.[2] C07F *7/22*
U.S. Cl. 260—429.7 **1 Claim**

1. Tricyclopentyltin fluoride as a novel triorganotin compound.

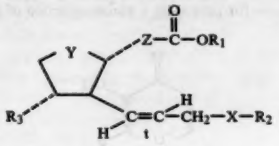
4,191,699

VARIOUS- 15-DEOXY-16-HYDROXY-16-ETHYNYL AND 16-ETHYNYLSUBSTITUTED PROSTAGLANDINS

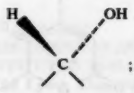
Middleton B. Floyd, Jr., Suffern, N.Y.; Martin J. Weiss, Oradell, N.J.; Charles V. Grudzinskas, Nyack, N.Y., and Sow-Mei L. Chen, Park Ridge, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 706,343, Jul. 19, 1976, Pat. No. 4,061,670. This application Dec. 5, 1977, Ser. No. 857,714
Int. Cl.[2] C07C *177/00*
U.S. Cl. 260—448.2 D **29 Claims**

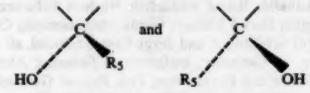
1. An optically active compound of the formula:



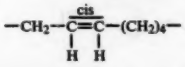
wherein Y is a divalent moiety of the formula:



R_1 is selected from the group consisting of hydrogen and C_1 to C_6 alkyl; R_2 is selected from the group consisting of C_3 to C_7 alkyl; R_3 is selected from the group consisting of hydrogen and hydroxy; X is selected from the group consisting of a divalent moiety of the formula:

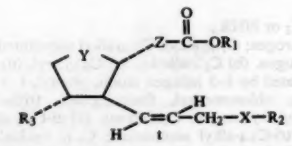


wherein R_5 is selected from the group consisting of 1-propenyl, ethynyl and trimethyl-silylethynyl; Z is selected from the group consisting of a divalent moiety of the formula:

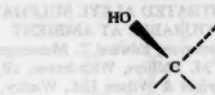


the racemic mixture thereof; and, when R_1 is hydrogen, the pharmacologically acceptable salts thereof.

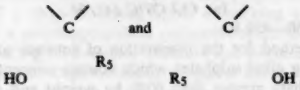
2. An optically active compound of the formula:



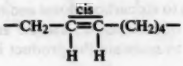
wherein Y is a divalent moiety of the formula:



R_1 is selected from the group consisting of hydrogen and C_1 to C_6 alkyl; R_2 is selected from the group consisting of C_3 to C_7 alkyl; R_3 is selected from the group consisting of hydrogen and hydroxy; X is selected from the group consisting of a divalent moiety of the formula:



wherein R_5 is selected from the group consisting of 2-propynyl, ethynyl and trimethylsilylethynyl; Z is selected from the group consisting of a divalent moiety of the formula:



the racemic mixture thereof; and, when R_1 is hydrogen, the pharmacologically acceptable salts thereof.

4,191,700

SYNTHETIC LIQUID FUELS

Howard E. Lebowitz, San Jose; Ronald H. Wolk, San Jose; Seymour B. Alpert, Los Altos; Norman C. Stewart, San Jose, and William C. Rovesti, Sunnyvale, all of Calif., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 799,831, May 23, 1977, abandoned. This application Aug. 2, 1978, Ser. No. 930,266

Int. Cl.[2] **C07C** *1/04, 31/06*

U.S. Cl. 260—449 M **8 Claims**

1. A highly efficient method of producing from coal liquid volatile products having fuel values which comprises:

(a) in a hydroliquefaction zone liquefying coal by contacting comminuted coal with hydrogen and a hydrogen donor recycle solvent boiling in the range of about 400°–975° F. under severe conditions comprising temperatures in the range of 800° to 900° F. and pressures in the range of 1,000 to 3,000 psig and a solvent to coal weight ratio of 1.5–3:1 to produce a high yield of light distillates boiling below about 650° F. said yield of light distillates comprising from about 15 to 45 weight percent of the coal (dry ash free basis), whereby a substantially gaseous effluent and a substantially liquid effluent are obtained;

(b) transferring said liquid effluent to a vacuum distillation separation zone and distilling said liquid effluent into a light distillate fraction, boiling below about 400° F., a middle distillate solvent fraction boiling between about 400° to 650° F., a heavy distillate fraction boiling between about 650° to 975° F., and vacuum bottoms slurry boiling above about 975° F., the quantity of which, when gasified, will supply substantially more gas than is required for producing hydrogen for the hydroliquefier;

(c) pumping said vacuum bottoms slurry into a partial oxidation gasifier and transforming said bottoms to synthesis gas consisting essentially of carbon monoxide and hydrogen;

(d) shifting the hydrogen to carbon monoxide ratio of the said synthesis gas to produce a hydrogen enriched gas and removing the acid gases therefrom;

(e) recycling a portion of said hydrogen enriched gas from said synthesis gas from step (d) to the hydroliquefier;

(f) reacting the remainder of said synthesis gas to produce methanol or methane;

(g) recycling at least a portion of said 400°–650° F. and said 650°–975° F. fractions in admixture as said recycle hydrogen donor solvent to said hydroliquefaction zone.

(h) utilizing excess of said 650°–975° F. as fuel for the plant.

(i) withdrawing the remainder of product boiling below about 650° F. not recycled in step (g).

4,191,701

ALCOHOL SEPARATION

Charles E. Moyer, Jr., Charleston; George E. Keller, II, South Charleston; Robert W. Beisner, and Wellington E. Walker, both of Charleston, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 674,822, Apr. 8, 1976, abandoned, which is a continuation of Ser. No. 506,862, Sep. 17, 1974, abandoned. This application Apr. 11, 1977, Ser. No. 786,584

Int. Cl.[2] **C07C** *27/06, 27/34*

U.S. Cl. 260—450 **4 Claims**

1. The process of separating products obtained from the reaction of an oxide of carbon and hydrogen in a solvent containing homogeneous liquid phase mixture containing a catalytic amount of rhodium in complex combination with carbon monoxide which comprises volatilizing said products of the reaction from the mixture at a temperature lower than that which causes the carbon monoxide to react with product, solvent or hydrogen, at a temperature which ranges from about 50° C. to about 300° C., and at a pressure which ranges from about 0.001 to about 1000 atmospheres while simultaneously maintaining the mixture in contact with added carbon monoxide gas.

4,191,702

PREPARATION OF ALKYL OR ARALKYL THIOSULFATES

Gilbert Chapelet, Bron; Patrice Lubin, Meusnes, and Robert Nouguier, Plan de Cuques, all of France, assignors to Elf Union, Paris, France

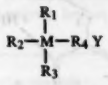
Filed Oct. 16, 1978, Ser. No. 951,521

Claims priority, application France, Oct. 11, 1978, 77 30979

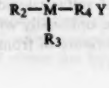
Int. Cl.[2] **C07C** *153/07*

U.S. Cl. 260—453 RY **14 Claims**

1. In a process for preparing alkyl, alkaryl, acylester or aralkyl thiosulfates by reaction of an alkyl, alkylene, acylester or aralkyl halide with thiosulfate, the improvement which comprises reacting an alkyl, alkylene, acylester or aralkyl halide in an organic solvent, for said halide; immiscible with water, with an aqueous solution of the thiosulfate, in the presence of from 0.5 to 10 moles percent, based on the moles of said halide, of a phase transfer agent of the formula



wherein M is N or P, Y is halide or OH and R_1, R_2, R_3 and R_4 are independently aryl, alkaryl, alkyl, hydroxy alkyl, and carboxy alkyl, wherein not more than one R can be hydroxy alkyl and carboxy alkyl and the total number of carbon atoms in R_1, R_2, R_3 and R_4 is from 5 to 40, and ion exchange resins containing grafted quarternary ammonium groups of the formula



wherein R_1, R_2, R_3, R_4 and Y are as defined herebefore, which permits the thiosulfate ion to pass from the aqueous phase to the organic phase wherein the reaction occurs.

4,191,703

PROCESS FOR THE MANUFACTURE OF SULFURIC ACID SEMI-ESTER COMPOUNDS

Hans H. Steuernagel, Kelkheim, and Ernst Hoyer, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

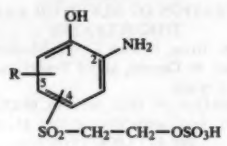
Continuation of Ser. No. 820,848, Aug. 1, 1977, abandoned. This application Jun. 8, 1978, Ser. No. 913,538

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1976, 2634787

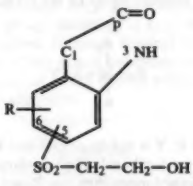
Int. Cl.[2] C07C *141/18*

U.S. Cl. 260—458 C **5 Claims**

1. In a process for the preparation of an aminophenol-sulfuric acid semi-ester of the formula



in which R is hydrogen, lower alkyl, nitro, chlorine or bromine, and the β-sulfatoethyl sulfonyl group is in the 4-position or 5-position of the benzene nucleus, by reaction comprising esterification by sulfuric acid, sulfur trioxide or sulfuric acid containing sulfur trioxide, and hydrolytic ring cleavage of a benzoxazolone compound of the formula



in which the β-hydroxyethylsulfonyl group is in the 5-position or 6-position of the benzoxazolone ring and R is defined as above, the improvement which comprises reacting with 1- to 2-times the equimolar amount, calculated on SO_3, of an esterifying agent selected from the group consisting of a 92 to 100% strength sulfuric acid, of sulfur trioxide and of sulfuric acid containing sulfur trioxide, optionally with the subsequent addition of water, at a temperature of from 100° to 180° C. while kneading.

4,191,704

HIGHLY CONCENTRATED ALKYL SULPHATE SOLUTIONS POURABLE AT AMBIENT

Douglas E. Mather, Whitehaven; Edward T. Messenger, High Harrington, and Bryn M. Phillips, Whitehaven, all of England, assignors to Albright & Wilson Ltd., Warley, United Kingdom

Continuation of Ser. No. 708,963, Jul. 26, 1976, abandoned, which is a continuation-in-part of Ser. No. 541,371, Jan. 15, 1975, abandoned. This application Jun. 24, 1977, Ser. No. 809,709

Claims priority, application United Kingdom, Jan. 16, 1974, 02038/74

The portion of the term of this patent subsequent to Nov. 25, 1996, has been disclaimed.

Int. Cl.[2] C07C *141/04*

U.S. Cl. 260—459 R **13 Claims**

1. A method for the preparation of aqueous solutions of gel-forming alkyl sulphates which contain concentrations of alkyl sulphate greater than 60% by weight and which are pourable at ambient temperatures which consists essentially in mixing an acid of the formula RSO_4H, where R is an alkyl group, having an average of 12 to 16 carbon atoms and a sufficient amount of a base selected from the group consisting of ammonium hydroxide and alkylamines and alkylolamines having a total of up to six carbon atoms and mixtures thereof to provide a final pH of between 6.5 and 8.5 and in the presence of sufficient water to maintain the product in the G phase.

4,191,705

PROCESS FOR THE PREPARATION OF CARBONIC ACID ESTERS OF POLYESTER-POLYOLS

Christian Lindner, Cologne; Carlhans Süling; Herbert Bartl, both of Odenthal; Manfred Schreckenberg, Krefeld; Dieter Freitag, Krefeld-Traar, and Klaus König, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 25, 1977, Ser. No. 845,174

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1976, 2651639

Int. Cl.[2] C07C *68/00, 69/96*

U.S. Cl. 260—463 **15 Claims**

1. A process for the preparation of a carbonic acid aryl ester of a polyester-polyol from a polyester-polyol having an average molecular weight ($\overline{Mn}$) above about 250 and a carbonic acid bis-aryl ester, comprising heating the polyester-polyol with the carbonic acid bis-aryl ester at a temperature from about 100° C. to 200° C. at a pressure less than about 35 mm Hg in the presence of a catalyst, more than one mol of carbonic acid bis-aryl ester being employed per mol of OH-group, and distilling off the hydroxyaryl compound formed and the excess carbonic acid bis-aryl ester.

14. The product of the process of claim **1**.

4,191,706

AROMATIC AMINE-AMIDES AND USE AS CHAIN-EXTENDERS

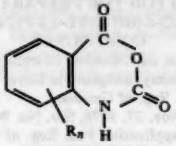
Edward T. Marquis, and Ernest L. Yeakey, both of Austin, Tex., assignors to Texaco Development Corp., White Plains, N.Y.

Filed Apr. 13, 1978, Ser. No. 895,840

Int. Cl.[2] C07C *103/28, 103/78, 103/82, 99/04*

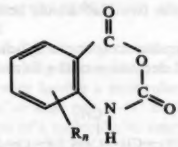
U.S. Cl. 260—559 A **6 Claims**

1. A compound comprising a reaction product of a polyoxypropylene polyamine selected from the group consisting of diamines, triamines and mixtures thereof, and having an average molecular weight of 190 to about 3000 and an isatoic anhydride of the formula:



where R is selected from the group consisting of hydrogen, alkyl nitro, halo, hydroxy, amino, and cyano, and n is a number of 1–4.

4. A polyurethane composition prepared by reacting an organic polyisocyanate with a polymeric polyhydroxy compound and a chain-extending agent comprising a reaction product of a polyoxypropylene polyamine selected from the group consisting of diamines, triamines and mixtures thereof, and having an average molecular weight of 190 to about 3000 and an isatoic anhydride of the formula:



where R is selected from the group consisting of hydrogen, alkyl nitro, halo, hydroxy, amino, and cyano, and n is a number of 1–4.

4,191,707

2-DECARBOXY-2-AMINOMETHYL-9-DEOXY-9-METHYLENE-16-PHENYL-PGF COMPOUNDS

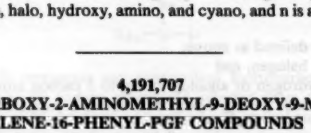
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 786,249, Apr. 11, 1977, Pat. No. 4,118,584. This application Jul. 12, 1978, Ser. No. 923,831

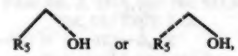
Int. Cl.² C07C *87/45*

U.S. Cl. 260—570.5 CA **210 Claims**

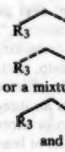
1. A prostaglandin analog of the formula



wherein Y_1 is trans-CH=CH—, —C≡C—, or —CH_2CH_2—;
wherein M_1 is



wherein R_5 is hydrogen or methyl;
wherein L_1 is



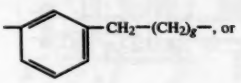
or a mixture of

and

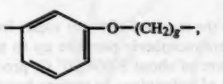
-continued

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein Z_1 is

(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,
(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,
(3) cis—CH_2—CH=CH—$(CH_2)_g$—CH_2—,
(4) —$(CH_2)_3$—$(CH_2)_g$—CH_2—,
(5) —$(CH_2)_3$—$(CH_2)_g$—CF_2—,
(6) —CH_2—O—CH_2—$(CH_2)_g$—CH_2—,
(7) —C≡C—CH_2—$(CH_2)_g$—CH_2—,
(8) —CH_2—C≡C—$(CH_2)_g$—CH_2—,



(9)



(10)

wherein g is one, 2, or 3;
wherein T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;
wherein L_2 and L_3 are hydrogen, or alkyl of one to 4 carbon atoms, inclusive.

4,191,708

PROCESS FOR PREPARING AND PURIFYING P-PHENYLENEDIAMINE

Hiromichi Okabe, Hirakata; Kiyomi Kishimoto, Kurashiki, and Fumio Ohi, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jan. 10, 1978, Ser. No. 868,435

Claims priority, application Japan, Jan. 28, 1977, 52-8958

Int. Cl.² C07C *85/26*

U.S. Cl. 260—582 **6 Claims**

1. In a process for preparing p-phenylenediamine by preparing p-aminoazobenzene from aniline by way of diazoaminobenzene and then reducing the p-aminoazobenzene, the improvement characterized by separating and removing o-aminoazobenzene produced as a by-product in the step of preparing p-aminoazobenzene, from the reaction product containing p-aminoazobenzene and o-aminoazobenzene as a by-product by crystallization from a solvent before p-aminoazobenzene is reduced.

4,191,709

MANUFACTURE OF AMINES FROM ALCOHOLS WITH ZEOLITE FU-1 CATALYSTS

David G. Parker, and Alan J. Tompsett, both of Middlesbrough, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jan. 29, 1979, Ser. No. 7,612

Claims priority, application United Kingdom, Feb. 6, 1978, 4655/78

Int. Cl.² C07C *85/06*

U.S. Cl. 260—583 R **9 Claims**

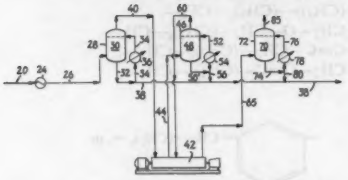
1. A process for the manufacture of an amine which comprises reacting an alcohol with ammonia at an elevated temperature in the presence of either the hydrogen form of zeolite

FU-1 or zeolite FU-1 in which some or all of the protons have been replaced by bivalent or trivalent cations.

4,191,710
TREATMENT OF METHACROLEIN-CONTAINING GASES

James Leacock, New York, N.Y., assignor to Halcon Research and Development Corp., New York, N.Y.

Filed Sep. 6, 1977, Ser. No. 830,736
Int. Cl.[2] C07C *45/02, 45/16*
U.S. Cl. 260—601 R 2 Claims



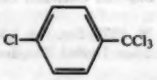
1. A process for the removal of water vapor from a gaseous stream under superatmospheric pressure up to about 50 psig and at a temperature of about 300°–500° C. produced by the catalytic oxidation of isobutylene or tertiary butyl alcohol and containing methacrolein, which comprises introducing said gaseous stream sequentially into a plurality of quenching zones arranged in series and each containing an aqueous stream with which said gaseous stream comes into direct contact in a plurality of contact stages, while increasing the superatmospheric pressure of said gaseous mixture between each of said plurality of quenching zones to a maximum pressure of about 250 psig while cooling said gaseous stream to a minimum temperature of about 35° C., the aqueous stream in each of said quenching zones being comprised of water containing dissolved components of said gaseous stream, whereby said gaseous mixture is introduced sequentially into said zones at a graduated increased pressure and the superatmospheric pressure in each succeeding zone is greater than the superatmospheric pressure in the preceding zone.

4,191,711
PROCESS FOR THE PREPARATION OF CERTAIN NUCLEAR CHLORINATED BENZOTRICHLORIDES

Manfred Lenthe, Lohmar, and Hans-Helmut Schwarz, Krefeld, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 832,758, Sep. 12, 1977, abandoned. This application Jul. 17, 1978, Ser. No. 925,494
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1976, 2644641
Int. Cl.[2] C07C *25/08, 25/16*
U.S. Cl. 260—650 R 14 Claims

1. A process for the preparation of 3,4-dichlorobenzotrichloride, 3,4,5-trichlorobenzotrichloride, 2,4,5-trichlorobenzotrichloride or 2,3,4,5-tetrachlorobenzotrichloride which comprises contacting at a temperature between 0° and 180° C. p-chlorobenzotrichloride of the formula



(I)

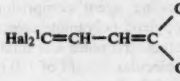
with chlorine or an agent which releases chlorine in the presence of an iron (III) chloride or aluminum chloride catalyst or a mixture of iron (III) chloride or aluminum chloride with sulfur dichloride or disulfur dichloride.

4,191,712
PROCESS FOR THE PREPARATION OF 1,1-DIHALO-4-METHYL-1,3-PENTADIENE COMPOUNDS

Dieter Arlt, Cologne, and Manfred Jautelat, Burscheid, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 27, 1978, Ser. No. 964,216
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1977, 2756271
Int. Cl.[2] C07C *17/24*
U.S. Cl. 260—654 D 14 Claims

1. Process for the preparation of a 1,1-dihalogeno-4-methyl-1,3-pentadiene of the formula

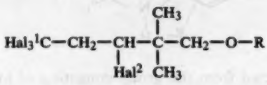


(II),

in which

Hal^1 is halogen, the two Hal^1 atoms being independent of one another

which process comprises reacting a 2,2-dimethyl-3,5,5,5-tetrahalogenopent-1-yl derivative of the formula



(I),

in which

Hal^1 is defined as above,

Hal^2 is halogen, and

R is hydrogen or alkanoyl of up to 5 carbon atoms with a substance having a basic reaction in a temperature range from 20° to 160° C.

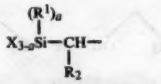
4,191,713
ROOM TEMPERATURE CURABLE COMPOSITION

Kazuya Yonezawa; Yasushi Kato; Hisao Furkawa, and Masaaki Azuma, all of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 28, 1978, Ser. No. 973,888
Claims priority, application Japan, Dec. 29, 1977, 52/159437
Int. Cl.[2] C08L *43/04, 83/12*
U.S. Cl. 525—102 12 Claims

1. A room temperature-curable composition, comprising, as effective ingredients, the following components (A) and (B)

(A) one, or a mixture of two or more, of polyesters, ether ester block copolymers, vinyl polymers, diallyl phthalate series compounds and diallyl phthalate series copolymer having in one molecule at least one silyl group represented by the following general formula:



wherein R^1 and R^2 each represents a hydrogen atom or a monovalent hydrocarbyl group selected from the group consisting of alkyl group, aryl group and aralkyl group having 1 to 10 carbon atoms; "X" represents a group selected from the group consisting of halogen atom, alkoxy group, acyloxy group, ketoximato group, amido group, acid amido group, aminoxy group and mercapto group, and "a" represents an integer 0, 1, or 2; and

(B) one, or a mixture of two or more, of silicon compounds containing in one molecule, at least one "V" group bound

to the silicon, and containing 1–20 silicon atoms, and wherein "V" represents a group selected from the group consisting of hydride group, hydroxyl group, alkoxy group, acyloxy group, ketoximato group, amido group, acid amido group, aminoxy group and mercapto group.

4,191,714

CURABLE POLYESTER OLIGOMER AND A PROCESS FOR PRODUCING SAME

Kazuya Yonezawa; Yasushi Kato; Hisao Furukawa, and Masaaki Azuma, all of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 28, 1978, Ser. No. 973,889

Claims priority, application Japan, Dec. 29, 1977, 52/159436; May 31, 1978, 53/66116

Int. Cl.[2] C08L *83/12, 43/04*

U.S. Cl. 525—102 **10 Claims**

6. A process for producing curable polyester oligomer, characterized by making a compound comprised substantially of polyester oligomer having a molecular weight of between 200 and 8,000 and at least one C—C double bond at the side chain or at the end of a molecule, to react with a hydrosilane compound represented by the formula:

wherein R represents any monovalent hydrocarbon radical having 1 to 10 carbon atoms and selected from the group consisting of alkyl radical, aryl radical and aralkyl radical, "X" represents any radical selected from the group consisting of halogen alkoxy, acyloxy, aminoxy, phenoxy, thioalkoxy and amino radicals, and "a" is an integer of 0, 1, or 2, at a temperature between 50° C. and 150° C.

8. The process of claim 6, wherein a compound comprising substantially polyester is the polymerization product of an acid anhydride with epoxy compound in the presence of alcohol.

4,191,715

FLAME RETARDING COMPOUND

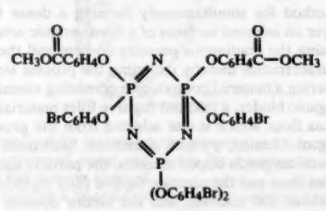
Chester C. Wu, Raleigh, N.C., and Albert Y. Garner, Yellow Springs, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed Jul. 3, 1978, Ser. No. 921,649

Int. Cl.[2] C07F *9/06*

U.S. Cl. 260—927 N **1 Claim**

1. A flame retarding agent having the formula:



4,191,716

CARBURETOR FOR INTERNAL COMBUSTION ENGINES

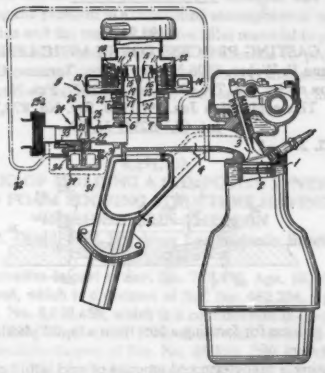
Ryuichi Yamashita, and Hiromitsu Matsumoto, both of Hamamatsu, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Continuation of Ser. No. 851,264, Nov. 14, 1977, abandoned, which is a continuation of Ser. No. 649,214, Jan. 15, 1976, abandoned. This application Dec. 18, 1978, Ser. No. 970,135

Claims priority, application Japan, Feb. 26, 1975, 50-23586

Int. Cl.[2] F02M *1/06*

U.S. Cl. 261—23 A **5 Claims**



1. A carburetor for an internal combustion engine which includes intake passage means leading to combustion chamber means of the engine, said carburetor comprising: throttle valve means provided in said intake passage means; a float chamber means having a region overlaying fuel therein; main fuel nozzle means provided in said intake passage means for supplying fuel from said main float chamber for normal operation of said engine; means for controlling supply of fuel to said main fuel nozzle means; starting air passage means which is smaller in cross-sectional area than the intake passage means and opening to the intake passage means at the downstream side of the throttle valve means; a starter valve means in said starting air passage means; means connected to said float chamber for supplying starting fuel to starting fuel nozzle means which starting fuel nozzle means opens to said starting air passage means for supplying starting fuel to said starting air passage means to form a starting air-fuel mixture, said starter valve means being provided with means for connecting said overlaying region of the float chamber means with said intake passage means at the downstream side of the throttle valve means when the starter valve means is in open position and opening said float chamber means to atmosphere when the starter valve means is in closed position, whereby the amount of starting fuel to said intake passage means is controlled in accordance with load on the engine in such a manner that the amount of starting fuel is increased as the engine load is increased.

2. A carburetor for an internal combustion engine which includes intake means leading to combustion chamber means of the engine, said carburetor comprising: throttle valve means provided in said intake passage means, a main float chamber having a region overlaying fuel therein; main fuel nozzle means provided in said intake passage means for supplying fuel from said main float chamber for normal operation of said intake passage means; means for controlling supply of fuel to said nozzle means; starting air passage means which is smaller in cross-sectional area than the intake passage means and opening to the intake passage means at the downstream side of the throttle valve means; a shut-off valve in said starting air passage means; means for supplying starting fuel to said starting air passage means to form a starting air-fuel mixture, said last-named means including starter float chamber means connected

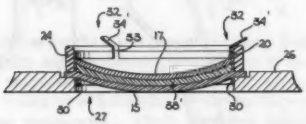
to starting fuel nozzle means opening to said starting air passage means, said starter float chamber means having a region overlaying fuel therein; and starting fuel control means including connecting passage means for subjecting the said region of said starter float chamber means to the influence of intake pressure in the intake passage at the downstream side of the throttle valve means, whereby the amount of starting fuel to said intake passage means is controlled in accordance with load on the engine in such a manner that the amount of starting fuel is increased as the engine load is increased, said region in said main float chamber not being connected to said intake passage at the downstream side of the throttle valve means.

4,191,717

CASTING PROCESS FOR PLASTIC LENSES

Hermann P. Weber, 5506 Beckford Ave., Tarzana, Calif. 91356

Division of Ser. No. 796,699, May 13, 1977, Pat. No. 4,095,772.
This application Jan. 19, 1978, Ser. No. 870,749
Int. Cl.[2] B29D *11/00*
U.S. Cl. 264—1 **3 Claims**



1. A process for forming a lens from a liquid plastic comprising the steps of:

metering a predetermined amount of said liquid plastic into a lower mold having a first optical surface;

placing an upper mold having a flexible support and a second optical surface on the upper surface of said liquid, said upper mold partly supported by said lower mold and partly supported by said liquid plastic;

said flexible support comprising a plurality of flexible ears providing self-compensation by which said upper mold will resist the downward movement of said mold during curing;

curing said plastic and at the same time controllably drawing down said upper mold against said resistance of said flexible ears by the action of said curing plastic and maintaining said upper mold parallel to said lower mold;

said drawing down step including the upward bending of said flexible ears;

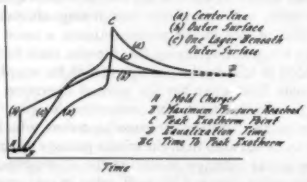
whereby a lens is formed between said first and second optical surfaces.

4,191,718

THICK SECTION COMPRESSION MOLDED COMPOSITES

Pankaj K. Mallick, and Narasimhan Raghupathi, both of Westland, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 19, 1977, Ser. No. 861,801
Int. Cl.[2] B29C *25/00*
U.S. Cl. 264—26 **5 Claims**



1. A method of compression molding of layered compounds comprising reinforcing glass fiber, thermosetting ester or epoxy resin and catalyst in a thickened dispersion wherein heat and pressure are applied to form structural thermosets having thick sections above about one quarter inch, which method comprises:

(A) dielectrically preheating the molding compound or portion thereof to a temperature at least about 100° F. and up to about 200° F. for less than about 2 minutes and without pregelling;

(B) introducing the preheated molding compound into a mold which is maintained at a temperature in excess of about 220° F. but below that which causes premature gelling of the molding compound and so as to cover at least about 50% of the area of the lower mold surface;

(C) applying a peak pressure of at least about 200 psi to the molding compound in the mold sufficient to cause its flow and filling of the mold to form a molded object;

(D) maintaining the molded object in the mold at elevated pressure and temperature for a time in excess of that at which the peak internal exotherm occurs;

(E) removing the molded object from the mold;

(F) optionally, post-treating the molded object by allowing it to cool after removal from the mold at an average rate in a range of up to about 15° F. per minute for the first five minutes.

4,191,719

PROCESS FOR PRODUCING MULTICELLULAR ARTICLES FROM A BLEND OF A CRYSTALLINE POLYOLEFIN AND A METAL RESINATE

James Jack, Mistley, and Godfrey A. King, Manningtree, both of England, assignors to Bakelite Xylonite Limited, London, England

Division of Ser. No. 454,763, Mar. 25, 1974, abandoned. This application Jul. 19, 1976, Ser. No. 706,594
Int. Cl.[2] B29D *27/00*
U.S. Cl. 264—41 **11 Claims**

1. A process for the production of a multicellular stretched article, which comprises forming a blend of a crystalline polyolefin and at least one additive, the additive comprising from more than 2 to about 50% by weight, calculated on the weight of the blend, forming a shaped article from the blend and stretching the article uniaxially or biaxially to produce a multicellular stretched article, wherein the additive is at least one metal resinate which is at least partially incompatible with the polyolefin at least at the temperature at which the article is to be stretched, the blend is formed by blending the polyolefin with the metal resinate at a temperature at which both the metal resinate and the polyolefin are molten or at least soft, and stretching is effected at a temperature within the normal orientation temperature range for the polyolefin, which temperature is below the softening point of the metal resinate.

4,191,720

METHOD FOR MAKING POROUS, CRUSHABLE CORE HAVING AN INTEGRAL OUTER BARRIER LAYER

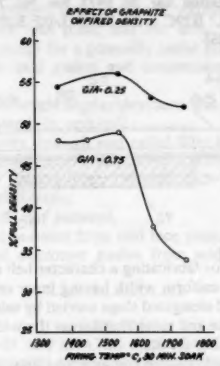
Wayne D. Pasco, Ballston Lake, and Frederic J. Klug, Amsterdam, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 6, 1977, Ser. No. 839,992
Int. Cl.[2] B29H *7/20*
U.S. Cl. 264—43 **13 Claims**

1. A method for simultaneously forming a dense integral barrier layer on selected surfaces of a fired ceramic article and for increasing the continuous porosity content and the crushability characteristics thereby including the process steps of

(a) preparing a material composition consisting essentially of an organic binder, a reactant fugitive filler material and an alumina flour which is one selected from the group consisting of alumina, yttrium aluminate, lanthanum aluminate, and magnesia doped alumina, the particle size of the alumina flour and the reactant fugitive filler material is less than about 300 microns, and the binder consists of less than 50 percent by volume;

(b) working a portion of the material composition to produce a preform of a predetermined shape;
(c) heating the preform to remove the organic binder from the preform while retaining substantially all of the reactant fugitive filler material therein and to obtain desired green strength;
(d) firing the preform in a controlled atmosphere to react the



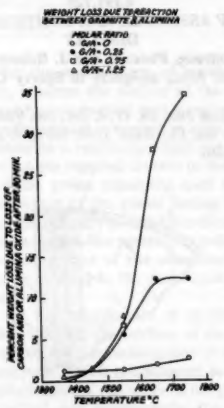
alumina and the reactant fugitive filler material to produce at least one or more suboxides of alumina to produce a ceramic article having a predetermined continuous porosity content, grain morphology and crushability characteristics, and
(e) oxidizing at least a portion of the suboxides of alumina to form a dense integral barrier layer of alumina at the surface of the ceramic article.

4,191,721

MAKING CERAMIC ARTICLES HAVING A HIGH DEGREE OF POROSITY AND CRUSHABILITY CHARACTERISTICS

Wayne D. Pasco, Ballston Lake; Frederic J. Klug, Amsterdam, and Svante Prochazka, Ballston Lake, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 6, 1977, Ser. No. 839,994
Int. Cl.[2] B29H 7/20
U.S. Cl. 264—43 **12 Claims**


WEIGHT LOSS DUE TO REACTION BETWEEN GRAPHITE & ALUMINA
MOLAR RATIO
○ G/A= 0
● G/A= 0.25
□ G/A= 0.75
△ G/A= 1.25
PERCENT WEIGHT LOSS DUE TO LOSS OF CARBON AND OF ALUMINA OXIDATION 60 MIN.
TEMPERATURE °C

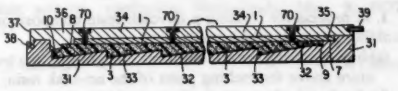
1. A method for increasing the porosity and the crushability characteristics of cores and molds for investment casting including the process steps of
(a) preparing a material composition consisting essentially of an organic binder, a reactant fugitive filler material and an alumina flour which is one selected from the group consisting of alumina, yttrium aluminate, lanthanum alumina, and magnesia doped alumina, the particle size of the alumina flour and the reactant fugitive filler material is less than about 300 microns, and the binder consists of less than 50 percent by volume;
(b) working a portion of the material composition to produce a preform of a predetermined shape;
(c) heating the preform in a controlled atmosphere to remove the organic binder from the preform while retaining substantially all of the reactant fugitive filler material therein and to obtain desired green strength, and
(d) firing the preform in a controlled atmosphere to react the alumina and the reactant fugitive filler material to produce at least one or more suboxides of alumina to produce a ceramic article having a predetermined continuous porosity content, grain morphology, and crushability characteristics.

4,191,722

METHOD OF MOLDING A COMPOSITE SYNTHETIC RESIN FOAM ROOFING STRUCTURE HAVING AN INTEGRAL SKIN THEREON

Walter M. Gould, 1731 Harriman La., Redondo Beach, Calif. 90278

Continuation-in-part of Ser. No. 788,490, Apr. 18, 1977, abandoned, which is a division of Ser. No. 462,256, Apr. 19, 1974, Pat. No. 4,028,450, which is a continuation-in-part of Ser. No. 318,288, Dec. 26, 1972, abandoned, which is a continuation-in-part of Ser. No. 45,373, Jun. 11, 1970, abandoned. This application Dec. 6, 1977, Ser. No. 857,970
The portion of the term of this patent subsequent to Jul. 12, 1994, has been disclaimed.
Int. Cl.[2] B29D 27/04
U.S. Cl. 264—45.5 **8 Claims**



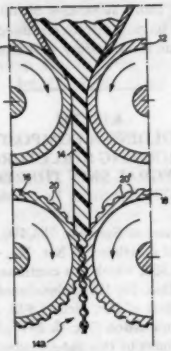
1. A method of molding a composite foam synthetic resin product in an open cavity mold comprising:
providing an open cavity mold having a step along a first end and first side of said mold cavity;
applying a barrier coat to the inside surface of said mold cavity;
providing a pressure plate cover having a stepped portion along one side and one end said stepped portion adapted to engage a second side and end of said mold cavity;
detachably securing a base member to said pressure plate with a side and end of said base member abutting the stepped portion of said pressure plate;
chilling the mold in a chilling compartment to chill the surfaces of the mold cavity;
injecting a foamable thermosetting resin reaction mixture into the chilled mold cavity;
securing the pressure plate and attached base member into said mold with said base member lying on the stepped portion along the first side and end of said mold cavity;
curing the resin reaction mixture for a period of time sufficient to permit it to foam and adhere to said base member;
removing said pressure plate from said mold after completion of curing; and
detecting the composite foam synthetic resin product from said pressure plate whereby a portion of the base member along one side and one end is exposed and a portion of the foamed resin reaction mixture is exposed along the opposite side and end of said product.

4,191,723

PROCESS FOR FORMING NOVOLAK RESIN COMPOSITIONS INTO MOLDING GRANULES

Silvio Vargiu, Casatenovo; Pier L. Manzoni, Codogno, and Mario Bernasconi, Maleo, all of Italy, assignors to Enteco S.p.A., Milan, Italy

Filed Aug. 1, 1977, Ser. No. 820,814
Claims priority, application Italy, Aug. 5, 1976, 26050 A/76
Int. Cl.² B29C 17/00
U.S. Cl. 264—129 19 Claims



1. A process for forming a novolak resin composition into molding granules, which comprises:

(a) homogenizing the novolak resin composition at a temperature above the melting point of the novolak resin;

(b) feeding the homogenized composition, at a temperature at which the said composition shows plasticity, but lower than the melting point of the novolak resin, between at least one pair of internally cooled rollers rotating in opposite directions with respect to each other with a peripheral speed of 0.15 to 0.30 m/sec., and having external surfaces separated from one another by a distance of 0.6 to 2 cm, so as to produce a coherent sheet by calendering;

(c) rolling said coherent sheet between a pair of internally cooled rollers, at least one of which has a plurality of indentations, rotating in opposite direction with respect to each other with a peripheral speed of 0.3 to 0.8 m/sec. and having external surfaces separated from each other by a distance of 0.02 to 0.5 cm, so as to produce a coherent embossed sheet;

(d) fracturating the said coherent embossed sheet and separating the granules having substantially the shape of the embossments from the fine and coarse fractions;

(e) mixing said granules with a liquid coating material comprising from 0.3 to 3 wt.%, with respect to the weight of the granules, of at least one coating agent selected from the group consisting of substituted phenols; polyphenols; products of the condensation, in an acid or alkaline medium, of phenol, substituted phenols or polyphenols with an aldehyde; and mixtures of said substituted phenols, polyphenols and condensation products with phenol; and

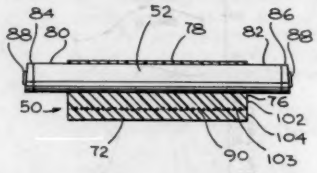
(f) heat-treating the coated granules thus obtained by flowing through the latter a stream of inert gas having a temperature not exceeding 130° C.

4,191,724

MOLDED CHARACTER BELT WITH INTEGRAL SLEEVES

Norman McMillan, Westlake Village, and Henry M. Dier, Woodland Hills, both of Calif., assignors to Dataproducts Corporation, Woodland Hills, Calif.

Division of Ser. No. 639,349, Dec. 10, 1975, abandoned. This application Apr. 26, 1977, Ser. No. 790,999
Int. Cl.² B29C 5/04; B29D 3/02; B29H 7/22
U.S. Cl. 264—255 4 Claims



1. A process for fabricating a character belt comprised of an endless band of uniform width having inner and outer peripheral surfaces and elongated slugs carried by said band adjacent said outer surface and extending across the width thereof, said method comprising the steps of:

providing a mold fixture having a first substantially cylindrically shaped surface defining a central opening, said first surface being shaped to open into a plurality of elongated axial cavities which extend radially outwardly from said first surface and which are uniformly spaced therearound, and a second substantially cylindrically shaped surface spaced radially inwardly from said first surface to define a channel of substantially uniform thickness therebetween;

positioning a plurality of elongated slugs, each having a peripheral surface and first and second end surfaces, in said plurality of cavities so that each slug peripheral surface is spaced from the cavity wall;

depositing molding material into said fixture; and

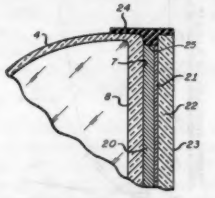
rotating said fixture to flow said molding material into said channel and said spaces between said slug peripheral surfaces and said cavity walls to form an endless band having inner and outer peripheral surfaces with sleeves extending from said outer peripheral surface around said slug peripheral surfaces and bonding thereto.

4,191,725

METHOD OF ASSEMBLING A CONTRAST ENHANCED DISPLAY

James B. Armstrong, Phoenix, and J. Robert Trimmier, Glendale, both of Ariz., assignors to Sperry Corporation, New York, N.Y.

Filed Jun. 28, 1978, Ser. No. 920,022
Int. Cl.² B29F 1/08; H01J 9/20
U.S. Cl. 264—261 8 Claims



1. A method for forming a filter-face plate combination on the viewing face of a bright display device incorporating the steps of:

supporting said bright display device with said viewing face upward,

placing an elastomer gasket on the periphery of said bright display device viewing face, said gasket having an inner annular lip, one side thereof being adapted to contact said viewing face generally at the periphery thereof,

placing a transparent face plate on the opposite side of said annular gasket lip,

applying pressure to said face plate generally at the periphery thereof thereby to form a cavity defined by said viewing face, said face plate, and the inner surface of said gasket lip, except for a generally radial filler hole extending through said gasket and communicating with said cavity,

reorienting said bright display device so that said radial filler hole is substantially vertical,

filling said cavity through said radial filler hole with a curable polymer material which includes colorants to provide the desired optical filter characteristics while avoiding formation of bubbles,

curing said polymer material,

removing said pressure from said face plate, and

removing said elastomer gasket from said bright display device.

4,191,726

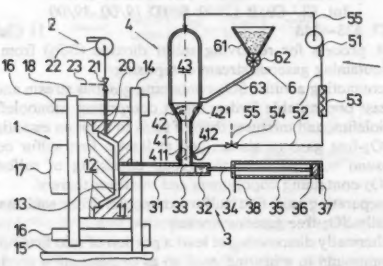
PROCESS AND APPARATUS FOR MANUFACTURING MOLDED PARTS FROM GRANULATED PLASTIC MATERIALS

Bruno Stillhard, St. Gallen, and Hans Näf, Wil, both of Switzerland, assignors to Gebrueder Buehler AG, Switzerland

Division of Ser. No. 809,680, Jun. 24, 1977, Pat. No. 4,158,540. This application Mar. 17, 1978, Ser. No. 887,553

Int. Cl.[2] B29F *1/08*

U.S. Cl. 264—517 **8 Claims**



1. A process for the manufacture of molded parts from granulated plastic, wherein the surface of the grains of the plastic pile required for one molded part is wet with a reactive monomeric preproduct and is subjected to a surface polymerization in a thin layer in a vestibule, which is connected to a mold cavity, by a hot gas supplied thereto to make it weldable with the cores of the grains remaining cool and solid and, subsequently, the surface of the grains having become weldable, the plastics pile is abrubtly pressed into the mold cavity of a hollow mold by an impact-like pressing at sufficient pressing speed and, upon termination of the compressive motion, a sufficient pressure is applied to the mold cavity, so that the plastics pile is sintered.

2. A process for the manufacture of molded parts from granulated plastics, wherein the surface of the grains of the plastic pile is required for one molded part is plasticized in a thin layer in a vestibule, which is connected to a mold cavity by a hot gas supplied thereto, the cores of the grain remaining cold and unplasticized, and subsequently, the surface of the grains having become weldable, the plastics pile is abruptly pressed into the mold cavity of the hollow mold by an impact-like pressing and sufficient pressing speeds and, upon termination of the compressive motion, a sufficient pressure is applied to the mold cavity, so that the plastics pile is sintered.

4,191,727

METHOD FOR THE SEPARATION OF A MIXTURE OF FINE PARTICLES

Wilhelm Brugger, Hösel, Fed. Rep. of Germany, assignor to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed May 22, 1978, Ser. No. 908,107

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1977, 2726419

Int. Cl.[2] C22B *59/00*; C01F *17/00*; C01G *56/00*; B01D *11/00*

U.S. Cl. 423—1 **10 Claims**

1. A method for separating a given fraction from a mixture of fine particles which are insoluble in water which fraction has a surface which is more chemically reactive than the remaining fractions and which produces a suspension having a pH of no more than 6 when suspended in water which comprises:

(a) grinding the mixture until the fraction to be separated has a particle size of less than about 50 microns;

(b) suspending the ground material at a temperature below 100° C. in a diluted aqueous solution of about 0.3 to 3% by weight based on the fraction to be separated of zirconium oxychloride or zirconium oxynitrate;

(c) separating the suspension from sediment therein by decantation; and

(d) adding a base to the separated suspension in an amount sufficient to precipitate the given fraction.

4,191,728

PROCESS FOR SELECTIVE EXTRACTION OF METAL IONS FROM AQUEOUS SOLUTIONS AND EXTRACTING AGENTS SUITABLE FOR THAT PURPOSE

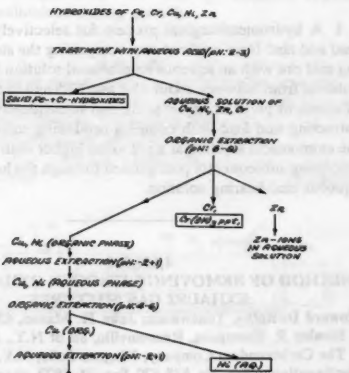
Martinus Tels; Jan P. Lotens, and Hendrikus P. M. Kivits, all of Eindhoven, Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Continuation-in-part of Ser. No. 883,668, Mar. 6, 1978, abandoned. This application May 9, 1978, Ser. No. 907,704

Claims priority, application Netherlands, Mar. 9, 1977, 7702517

Int. Cl.[2] C01G *3/00, 51/00, 53/00, 9/00*

U.S. Cl. 423—24 **6 Claims**



1. In a process for the selective extraction of copper and nickel ions from aqueous solution using a substantially immiscible organic extraction agent,

the improvement wherein said extraction agent is essentially composed of a mixture of (1) oleic acid, or (2) oleic acid and at least one other unsaturated fatty acid and a (cyclo) aliphatic oxime, of from 6 to 12 carbon atoms, and wherein the (1) copper and nickel ions are first extracted with said ex-

traction agent at a pH value of between 6 and 9 from an aqueous solution into said organic extraction agent,

(2) thereafter extracting the copper and nickel ions from said organic phase into a second aqueous phase at a pH of between −2 and +1, and thereafter,

(3) at a pH of between 4.0 and 6.0, selectively extracting said copper ions from said second aqueous phase with an extraction agent essentially composed of a mixture of (1) oleic acid, or (2) oleic acid and at least one other unsaturated fatty acid and a (cyclo) aliphatic oxime, of from 6 to 12 carbon atoms, and then

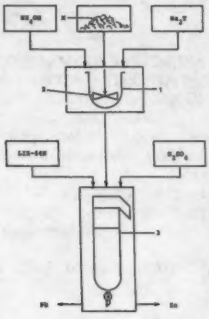
(4) the copper ions in the organic phase are again reabsorbed into a third aqueous phase at a pH of between −2 and +1.

4,191,729

HYDROMETALLURGICAL PROCESS FOR SEPARATING LEAD AND ZINC FROM OXIDIZED ORE

Giorgio Rinelli, and Carlo Abbruzzese, both of Rome, Italy, assignors to Consiglio Nazionale delle Ricerche, Rome, Italy

Filed Aug. 24, 1978, Ser. No. 936,386
Claims priority, application Italy, Aug. 26, 1977, 84142 A/77
Int. Cl.² C01G *21/00*
U.S. Cl. 423—98 **15 Claims**



1. A hydrometallurgical process for selectively separating lead and zinc from oxidized ore, comprising the steps of leaching said ore with an aqueous ammoniacal solution having a pH value of from between about 11.5 and 12.5 and in the presence of anions of polycarboxylic acids, and subsequently selectively extracting said lead with complex-producing solvents used in the ammoniacal solution at a pH value higher than about 9, the zinc being subsequently precipitated through the heating of the aqueous zinc-bearing solution.

4,191,730

METHOD OF REMOVING NITROGEN OXIDES FROM EXHAUST GAS MIXTURES

Howard D. Batha, Tonawanda; John H. Mason, Clarence, and Stanley R. Thompson, Ransomville, all of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Continuation of Ser. No. 835,470, Sep. 21, 1977, abandoned. This application Aug. 21, 1978, Ser. No. 934,738
Int. Cl.² B01D *53/34*
U.S. Cl. 423—239 **8 Claims**

1. A method of removing NO_x from exhaust gas mixtures by exposing the gas mixture in a substantially unimpeded flow to a ceramic material containing from about 75 to about 95% by weight silicon carbide and from about 0.3 to about 10.0% by weight silica at a temperature of at least about 1050° C. and less than about 1650° C. for a time sufficient to reduce the NO_x content by at least 85%.

4,191,731

WET PROCESS USING STEEL SLAG FOR WASTE GAS DESULFURIZATION

Yoshiaki Miura; Masataka Kaneyasu, and Akira Okamoto, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jan. 13, 1978, Ser. No. 869,221
Int. Cl.² C01B *17/00*
U.S. Cl. 423—242 **4 Claims**

1. In a wet process using slag for waste gas desulfurization consisting essentially of introducing the waste gas continuously into at least one absorber to desulfurize the waste gas by an aqueous slurry of the slag and simultaneously therewith to produce gypsum, discharging a part of the spent slurry from the absorber to recover gypsum and supplying fresh aqueous slurry to the absorber at the same rate as the spent slurry is discharged from the absorber, the improvement wherein the slag is steel slag and the desulfurization of the waste gas is conducted under the condition wherein log $pH \leqq -7.6\ SO_2(\%)/(O_2(\%)) + 0.90$, wherein pH is the pH value of the aqueous slurry of the steel slag contained in the absorber and is in the range of 4.5 to 8; $SO_2(\%)$ is the concentration of the solfurous acid gas contained in the waste gas at the inlet of the absorber; $O_2(\%)$ is the concentration of the oxygen contained in the waste gas at the inlet of the absorber; and wherein the $SO_2(\%)/O_2(\%)$ is 0.033 or less.

4,191,732

METHOD OF REMOVING SULFUR DIOXIDE FROM GASES

Carl A. Uraneck, and Paul H. Johnson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 15, 1977, Ser. No. 851,647
Int. Cl.² C01B *17/00*; B01D *19/00, 39/00*
U.S. Cl. 423—243 **11 Claims**

1. A process for removing sulfur dioxide (SO_2) from an SO_2-containing gaseous stream comprising:

(a) contacting a initial SO_2-containing gaseous stream and at least one suitable hydrocarbon comprising monoolefins, diolefins, and mixtures thereof so as to form an essentially SO_2-free gaseous stream and at least a first sulfur compound selected from the group consisting of sulfones, SO_2-containing copolymers and mixtures thereof

(b) separating said first sulfur compound from said essentially SO_2-free gaseous stream;

(c) thermally dissociating at least a portion of said first sulfur compound in a heating zone so as to generate a product mixture comprising SO_2 and said hydrocarbon;

(d) separating said hydrocarbon and said SO_2 by fractionating said product mixture in a fractionation zone; and

(e) recycling said hydrocarbon to the initial SO_2-containing gaseous stream.

4,191,733

REDUCTION OF CARBON MONOXIDE IN SUBSTOICHIOMETRIC COMBUSTION

Harold E. Swift, Gibsonia; Ajay M. Madgavkar, Pittsburgh, and Roger F. Vogel, Butler, all of Pa., assignors to Gulf Research and Development Company, Pittsburgh, Pa.

Filed Jul. 3, 1978, Ser. No. 921,329
Int. Cl.² B01D *53/34*
U.S. Cl. 423—245 **22 Claims**

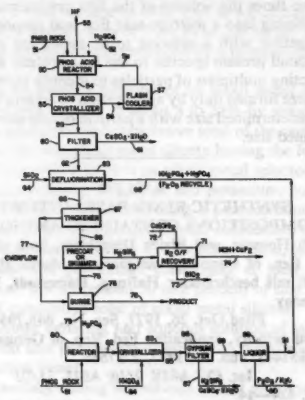
1. A method for the partial combustion of a low heating value gas stream with reduced carbon monoxide production for venting to the atmosphere, said gas stream having an average heating value in the range of about 5 to about 500 Btu/scf. and comprising a combustible component selected from one or more aliphatic hydrocarbons having from one to about seven carbon atoms and carbon monoxide and containing up to about 50 mol percent of one or more of said aliphatic hydrocarbons, up to about 15 mol percent carbon monoxide and up to about

10 mol percent hydrogen as the major combustible components which comprises tne steps passing said gas stream admixed with air for combustion at an average air equivalence ratio of between about 0.2 and about 0.9 in contact with a supported platinum oxidation catalyst having incorporated therewith at least one metal cocatalyst selected from Groups IIA and VIIB, Group VIII up through atomic No. 45, the lanthanides, chromium, zinc, silver, tin and antimony in at least one combustion zone at a temperature high enough to initiate and maintain combustion of said gas stream, and venting said partially combusted gas stream to the atmosphere.

4,191,734
FLUORIDE-FREE PHOSPHATE REACTIONS

Erhart K. Drechsel, Houston, Tex., and John B. Sardisco, Shreveport, La., assignors to Pennzoil Company, Shreveport, La.

Division of Ser. No. 785,772, Apr. 7, 1977, Pat. No. 4,105,748, Division of Ser. No. 696,290, Jun. 15, 1976, Pat. No. 4,055,626.
This application Mar. 20, 1978, Ser. No. 888,038
Int. Cl.² C01B 25/22
U.S. Cl. 423—320 5 Claims



1. A process for the production of substantially fluoride-free phosphoric acid and potassium dihydrogen phosphate which comprises:

(a) reacting phosphate rock with sulfuric acid to produce gypsum and phosphoric acid with evolution of fluoride gas;

(b) removing the gypsum solids;

(c) passing the phosphoric acid to a defluorination stage for treatment by the addition of silicon dioxide and K_2O,

(1) the potassium ion of said K_2O being provided by addition of KH_2PO_4, said potassium ion being provided in a sufficient amount to precipitate the fluorides remaining in said phosphoric acid and in a sufficient excess amount that the phosphoric acid recovered from the reaction will contain about 0.5 to 1.0 weight percent potassium ion as K_2O; and

(2) said silicon dioxide being provided in an amount sufficient to precipitate the fluorides remaining in said phosphoric acid;

(d) passing the resulting mixture to a separation stage wherein precipitated potassium silicofluoride is removed from the system;

(e) passing the resulting phosphoric acid to a separation stage and removing at least a portion from the system as feed grade phosphoric acid;

(f) passing the remainder of said resulting phosphoric acid to a reactor for reaction with phosphate rock and a member selected from the group consisting of potassium sulfate, potassium bisulfate, and mixtures thereof, to produce a mixture comprising KH_2PO_4, phosphoric acid, gypsum and precipitated K_2SiF_6;

(g) removing the gypsum and K_2SiF_6 solids from the system to provide a solution of phosphoric acid and KH_2PO_4;

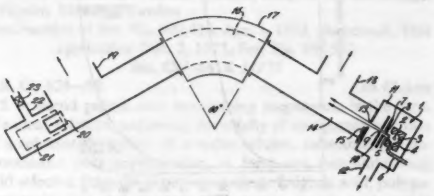
(h) removing at least a portion of the KH_2PO_4 and phosphoric acid from the system; and

(i) recycling the remaining solution to said defluorination stage to provide said K_2O.

4,191,735
GROWTH OF SYNTHETIC DIAMONDS

Richard S. Nelson, Reading; John A. Hudson, Radley, and David J. Mazey, Abingdon, all of England, assignors to National Research Development Corporation, London, England

Continuation-in-part of Ser. No. 711,578, Aug. 4, 1976, abandoned, which is a continuation-in-part of Ser. No. 477,280, Jun. 7, 1974, abandoned. This application Feb. 17, 1978, Ser. No. 878,862
Claims priority, application United Kingdom, Jun. 7, 1973, 27293/73; South Africa, May 30, 1977, 77/3271; United Kingdom, Jun. 2, 1977, 23468/77
Int. Cl.² C01B 31/06
U.S. Cl. 423—446 22 Claims

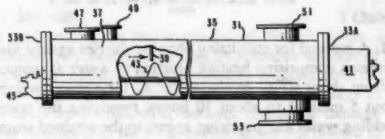


1. A method of growing a diamond crystal which comprises bombarding the diamond with a flux of carbon ions of sufficient energy to penetrate the diamond crystal and cause crystal growth which is at least predominantly internal, the temperature of the crystal being at least 400° C. and less than the graphitisation temperature, such that the diamond crystal structure is maintained during growth.

4,191,736
PROCESS FOR REACTING LIQUIDS WITH SOLIDS

Dong M. Chay, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 19, 1975, Ser. No. 633,544
Int. Cl.² C01B 7/08
U.S. Cl. 423—482 8 Claims



1. In a process for continuously reacting a liquid with a first solid coreactive therewith in which a gas is evolved and a second normally solid product is formed and dispersed in the liquid, the foaming tendencies of the reaction are reduced by

(1) forming a coreacting stream by admixing the liquid with granules of the first solid, the temperature of the admixture being sufficiently high to bring about the reaction; and

(2) subjecting the coreacting stream to non-turbulent flow through an enclosed conduit having a continuous vapor

space above the admixture, while subjecting the flowing coreacting stream to mild agitation to increase the liquid-solid and gas-liquid interface areas and remove gas from the coreacting liquid into the vapor space; and

(3) continuing the flow of the coreacting stream and removal of gas therefrom for a time sufficient to attain a predetermined degree of the coreaction.

4,191,737

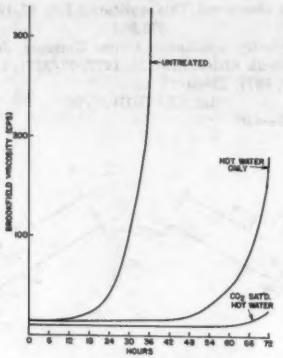
INCREASING ALUMINA SLURRY LIFE

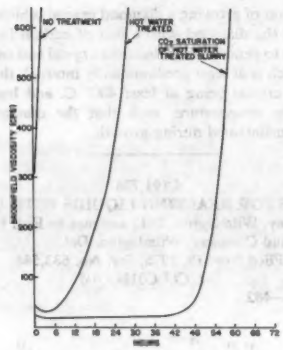
John L. Irvine, Ponca City, Okla., assignor to Conoco, Inc., Ponca City, Okla.

Filed Oct. 2, 1978, Ser. No. 948,124

Int. Cl.[2] C01F *7/00*

U.S. Cl. 423—630 **3 Claims**





1. A method for stabilizing alumina slurries against viscosity increases comprising heating alumina in water at temperature of from about 40° C. to about 100° C. for a time ranging from about 5 minutes to about 10 hours, removing the water and readding water and peptizing agents to the retained alumina to form a slurry then sparging carbon dioxide through the slurry.

4,191,738

IMMUNOASSAY FOR N-DESMETHYLDIAZEPAM

William R. Dixon, Dumont, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Apr. 7, 1978, Ser. No. 894,279

Int. Cl.[2] G01N *33/16*; A61K *43/00, 39/00*; G21H *5/02*

U.S. Cl. 424—1 **5 Claims**

1. A composition consisting essentially of the reaction product of the reactive acyl azide of 7-chloro-1,3-dihydro-5-(4-(hydrazinocarbonylmethoxyphenyl)-2H-1,4-benzodiazepin-2-one and an immunogenic carrier material.

4,191,739

ANTIGEN-ANTIBODY REACTION ASSAY EMPLOYING PARTICLE AGGREGATION AND RESISTIVE PULSE ANALYSIS

Egidijus E. Uzgiris, and Ralph W. De Blois, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 17, 1977, Ser. No. 842,952

Int. Cl.[2] G01N *27/00, 27/26, 31/00, 33/16*

U.S. Cl. 424—12 **10 Claims**

1. A method for detecting occurrence of an antigen-antibody reaction, comprising:

preparing a first suspension of particles of a first predetermined size, each particle of said first suspension being coated with a layer of a first protein;

preparing a second suspension of particles of a second predetermined size, each particle of said second suspension being coated with a layer of said first protein, the second predetermined size being greater than one and less than two times the volume of the first predetermined size;

combining into a mixture said first and second suspensions together with a solution to be tested for presence of a second protein specific to the first protein; and

detecting multiplets of particles to identify multiplets having a size formed only by aggregation of a particle of said first predetermined size with a particle of said second predetermined size.

4,191,740

SYNTHETIC RESIN-BASE, ANTIBIOTIC COMPOSITIONS CONTAINING AMINO ACIDS

Dietrich Heusser, and Elvira Dingeldein, both of Darmstadt, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Oct. 26, 1977, Ser. No. 845,703

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1976, 2651441; Jun. 18, 1977, 2727535

Int. Cl.[2] A61K *9/16*; A61L *15/03*

U.S. Cl. 424—14 **5 Claims**

1. A pharmaceutical composition consisting essentially of a base of fine pearl polymer spheroid, particles having diameters of 1–20 mm of methyl methacrylate-methyl acrylate copolymer, at least one antibiotic selected from gentamycin, erythromycin, lincomycin, clindamycin, novobiocin, vancomycin, fusidic acid, rifamycin, polymyxins, neomycin, kanamycin and tobramycin in antimicrobial amounts of about 0.2–15% by weight and an antibiotic-liberating agent, wherein the antibiotic liberating agent consists essentially of 0.3–5% by weight of at least one aliphatic, monoamino, monocarboxylic amino acid containing up to 5 carbon atoms selected from glycine, alanine, threonine, valine, serine, hydroxyproline, proline and mixtures thereof.

4,191,741

REMOVABLE DRUG IMPLANT

James L. Hudson, Indianapolis, and Jack F. Wagner, Greenfield, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 22, 1978, Ser. No. 944,946

Int. Cl.[2] A61M *7/00*; A61K *27/12, 9/00, 9/52*

U.S. Cl. 424—19 **7 Claims**

1. A solid, cylindrical, subcutaneous implant for improving the rate of weight gain of ruminant animals which comprises

(a) a biocompatible inert core having a diameter of from about 2 to about 10 mm. and

(b) a biocompatible coating having a thickness of from about 0.2 to about 1 mm., the composition of said coating comprising from about 5 to about 40 percent by weight of

estradiol and from about 95 to about 60 percent by weight of a dimethylpolysiloxane rubber.

4,191,742

AMORPHOUS PRECIPITATED SILICEOUS PIGMENTS AND METHODS FOR THEIR PRODUCTION

Satish K. Wason, and Robert K. Mays, both of Havre de Grace, Md., assignors to J. M. Huber Corporation, Locust, N.J.

Division of Ser. No. 703,496, Jul. 8, 1976, Pat. No. 4,067,746, which is a continuation of Ser. No. 472,580, May 22, 1974, abandoned. This application Nov. 23, 1977, Ser. No. 854,165

Int. Cl.[2] A61K *7/16*

U.S. Cl. 424—49 1 Claim

1. An oral dentifrice composition providing good cleaning and polishing of the teeth, comprising a polishing and abrasive ingredient, said polishing and abrasive ingredient comprising an amorphous precipitated silicon dioxide characterized as having a wet cake moisture of 66 to 76% inclusive, a structure index of from 200 to 354, an oil absorption of from 125 to 175 cc/100 grams; a void volume of from 2.55 to 4.0 cc Hg/gram SiO_2, and a BET surface area of from 80 to 200 square meters per gram; said silicon dioxide produced by a process comprising

(1) forming an aqueous solution of an alkali metal silicate having a concentration of about 8 to 25% by weight and having a predetermined cumulative total of the said alkali metal silicate; said alkali metal silicate having the formula $M_2O(SiO_2)_X$, wherein M is an alkali metal selected from the group consisting of sodium and potassium, and X is from 2 to 4 inclusive; introducing a predetermined mol percentage of the said predetermined cumulative total of the said alkali metal silicate to a reaction vessel, said predetermined mol percentage comprising at least 8 mol percent and not more than 50 mol percent of said predetermined cumulative total of alkali metal silicate;

(2) continuously agitating said aqueous solution of said predetermined mol percentage of said alkali metal silicate in said reaction vessel;

(3) simultaneously adding the balance of said predetermined quantity of said alkali metal silicate to be employed in the reaction and an aqueous solution of a mineral acid selected from the group consisting of sulfuric acid, nitric acid and phosphoric acid, to the said agitated alkali metal silicate in the said reaction vessel at rates and concentrations so proportioned as to provide a controlled increase of effective alkalinity such that the maximum alkalinity produced upon the completion of the addition of the total quantity of said alkali metal silicate at the time of maximum alkalinity t_m is from 20% to 500% higher than the initial alkalinity of the predetermined mol percentage of the cumulative total of the predetermined quantity of said alkali metal silicate to be employed in the reaction provided in the reaction vessel at the inception of the reaction;

(4) continuing the addition of said mineral acid after stopping the addition of said alkali metal silicate to a reaction mass pH of less than 6.0, said resulting reaction mass after all additions have been made thereto containing from 3 to 12% by weight of SiO_2 at the time of the completion of the reaction t_f, where t_f is from 20 minutes to 4 hours, and the time to maximum alkalinity, t_m, is from 55% to 90% of t_f;

(5) maintaining the reaction temperature of said alkali metal silicate reaction mass between 50° and 90° C. throughout the reaction;

(6) filtering said reaction slurry; and

(7) washing, drying, and milling said filtered mass, and recovering said silicon dioxide, when the said mol percentage initially charged to the reaction vessel is from 14 to 35%.

4,191,743

ANTIBACTERIAL WOUND DRESSING

Klaus Klemm, and Helmut Wahlig, both of Darmstadt, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Nov. 2, 1977, Ser. No. 847,868

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1976, 2650306

Int. Cl.[2] A61F *13/00, 7/02,* A61L *15/03*

U.S. Cl. 424—28 5 Claims

1. A sterile wound dressing comprising two layers of synthetic resin arranged one above the other and an intermediate layer of an antibiotic within hardened, formed spheroids of a synthetic resin granulate, having a particle size of 0.5–3 mm., wherein the synthetic resin granulate comprises a copolymer of methacrylic acid methyl ester and methyl acrylate, and the antibiotic is selected from gentamycin, neomycin, kanamycin, tobramycin or other aminoglycoside antibiotics, erythromycin, lincomycin, clindamycin, novibiocin, vancomycin, fusidic acid, rifamycin, polymyxins, penicillins, and caphalosporins.

4,191,744

NEUTRALIZING AGENT

Conny B. Bogentoft, Mölndal, Sweden, assignor to Aktiebolaget Hassle, Mölndal, Sweden

Continuation of Ser. No. 802,416, Jun. 1, 1977, abandoned. This application Dec. 2, 1977, Ser. No. 856,912

Int. Cl.[2] A61K *31/74*

U.S. Cl. 424—78 16 Claims

1. A liquid gastric acid neutralizing preparation in the form of a clear solution, consisting essentially of an aqueous solution of a substantial amount of a water-soluble, substantially non-crosslinked polyethyleneimine, at least one taste-improving acid selected from the group consisting of alginic acid, polygalacturonic acid, galacturonic acid, pectin, tannic acid, arabic acid, galactaric acid, and glutaric acid, and at least one acid selected from the group consisting of tartaric acid, fumaric acid, phosphoric acid, acetic acid, citric acid, succinic acid, and malic acid, the acid(s) from the latter group in such an amount that the pH of the preparation is 4 to 11, the preparation being substantially free from water-insoluble antacid compounds.

4,191,745

PREPARATION FOR THE TREATMENT OF HERPES ZOSTER AND OTHER HERPES INFECTIONS, AS WELL AS METHOD FOR MANUFACTURE THEREOF

Anton Mayr, Munich; Helmut Stickl, Krailling, and Melchior Westhues, Munich, all of Fed. Rep. of Germany

Filed Mar. 29, 1978, Ser. No. 891,206

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1977, 2714665

Int. Cl.[2] A61K *41/00;* C12K *7/00*

U.S. Cl. 424—90 7 Claims

1. A preparation for the treatment of Herpes zoster and other Herpes infections comprising an effective amount of an active principle obtained from pox and/or parapox virus of the family: poxyviridae which has suffered selective damage to its nucleic acids by γ-irradiation, without change or damage to the other structures of the virus including but not limited to its surface structure, the virus protein and the substance of the outer sheath, and a suitable carrier for said active principle.

6. A method for production of the preparation in accordance with one of the claims 1 or 2, comprising (1) innoculating cell cultures with an active principle of pox or parapox viruses of the family: poxviridae, at the peak of virus multiplication, (2) harvesting and purifying said virus, (3) preparing a titer of approximately 5×10^6 to 5×10^8 ID_{50}/ml of the virus suspension, (4) subjecting said titer to γ-irradiation whereby the nucleic acids of said virus are selectively damaged without change or damage to the other structures of the virus, including but not limited to its surface structure, the virus protein and

the substance of the outer sheath and, (5) optionally adding stabilizers and/or other therapeutic additives, whereby a preparation which can be administered either intraperitoneally or locally is prepared.

4,191,746

STERILIZATION PROCESS FOR MAMMALS

Gursaran P. Talwar, New Delhi, India, assignor to All India Institute of Medical Sciences, New Delhi, India

Filed Mar. 8, 1979, Ser. No. 18,624
Int. Cl.[2] A61K *39/04*
U.S. Cl. 424—92 **6 Claims**

1. A method of sterilizing mammalian species, which comprises intra-testicularly injecting Bacillus of Calmette and Guerin into each testicle of sperm-producing males of the species in an amount at least effective to achieve aspermatogenesis.

4,191,747

CORRECTIVE AGENT FOR THE COVERING AND/OR FILLING OF BONE DEFECTS, METHOD FOR THE PREPARATION OF SAME AND METHOD OF USING THE SAME

Hans Scheicher, Rondell Neuwittelsbach 4, D-8000 Munich, Fed. Rep. of Germany

Filed Dec. 14, 1977, Ser. No. 860,651
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1976, 2657370
Int. Cl.[2] A61K *37/48, 35/32, 37/00, 31/70*
U.S. Cl. 424—94 **36 Claims**

1. A corrective agent for the covering and/or filling of bone defects, comprising a physiological saline solution containing (1) at least one polysaccharide and/or gelatin and (2) at least one substance stimulating bone formation and/or bone growth, said solution being in liquid solution form at a temperature above body temperature but below the temperature at which body tissue is permanently damaged or coagulates and said solution forming a stable gel at body temperature.

17. A method of covering and/or filling bone defects which comprises applying to the defective area in flowable liquid form as a corrective agent a physiological saline solution containing at least one polysaccharide and/or gelatin at a temperature above body temperature but below the temperature at which body tissue is permanently damaged or coagulates and then allowing said solution to cool to a stable gel, whereby cavities formed around the defect are filled and where an implant is used, any gaps between the defect and the implant are filled.

4,191,748

NOVEL MEDICINAL COMPOSITION, ESPECIALLY FOR THE TREATMENT OF CELLULITIS

David Holzmann, 25, Boulevard Lannes, 75016 Paris, France

Filed Jan. 24, 1978, Ser. No. 871,875
Claims priority, application France, Jan. 24, 1977, 77 01900
Int. Cl.[2] A61K *37/48, 33/16, 31/52*
U.S. Cl. 424—94 **10 Claims**

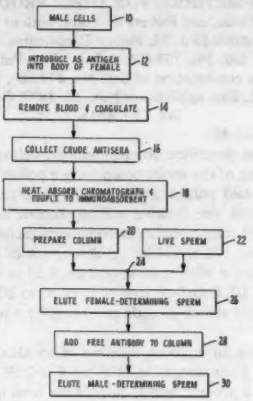
1. A medicinal composition useful for treating cellulitis, said composition consisting essentially of a xanthic base as a phosphodiesterase inhibitor and a fluorinated compound selected from the group consisting of an alkali metal fluoride, alkaline earth metal fluoride and ammonium fluoride, the inhibitor being present in about 0.1 to 60% by weight of the inhibitor plus fluorinated compound.

4,191,749

METHOD AND MATERIAL FOR INCREASING THE PERCENTAGE OF MAMMALIAN OFFSPRING OF EITHER SEX

Bernard J. Bryant, 509 Scripps Dr., Davis, Calif. 95616

Filed Oct. 11, 1977, Ser. No. 841,207
Int. Cl.[2] A61K *35/52;* C12K *9/00;* A61K *39/00*
U.S. Cl. 424—105 **14 Claims**



13. The method of increasing the percentage of mammalian offspring of either sex, comprising the step of selectively separating male-determining spermatazoa by contacting a body of seman with a male specific antibody capable of binding male specific sperm, said antibody being coupled to immunoabsorbent material.

4,191,750

METHOD FOR TREATING CANKER SORES

Milton Hodosh, 72 Overhill Rd., Providence, R.I. 02906

Filed Mar. 8, 1976, Ser. No. 665,161
Int. Cl.[2] A61K *33/06, 33/00*
U.S. Cl. 424—127 **8 Claims**

1. The method of curing canker sores by applying thereto an agent, the essential ingredient of which is an effective amount of a nitrate of one of the following alkali metals: potassium, lithium, sodium, magnesium, calcium or strontium.

4,191,751

METHOD FOR PROMOTING GROWTH OF NEW CONNECTIVE TISSUE OVER SURFACE WOUNDS

Sheldon K. Gottlieb, 8708 Wandering Trail Dr., Potomac, Md. 20854

Continuation-in-part of Ser. No. 764,229, Jan. 31, 1977, Pat. No. 4,061,731, Continuation-in-part of Ser. No. 576,858, Jun. 4, 1975, Pat. No. 4,006,220. This application Dec. 5, 1977, Ser. No. 857,526
Int. Cl.[2] A61K *37/12, 31/195*
U.S. Cl. 424—177 **10 Claims**

1. A method for promoting the growth of new connective tissue over a surface wound wherein at least a portion of the epithelium has been damaged or removed which comprises coating said wound with a composition consisting essentially of a connective tissue promoting agent of pulverized absorbable gelatin sponge, wherein plasma is present at the situs of the wound, said composition being present in an amount sufficient to promote the production of new connective tissue over said surface wound.

4,191,752

ISOLATION OF ANTI-MUTAGENIC FACTOR FROM CABBAGE JUICE

Tsuneo Kada; Tadashi Inoue, both of Tokyo, and Kazuyoshi Morita, Odawara, all of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Filed Sep. 6, 1978, Ser. No. 940,089

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1978, 2810293; Japan, Mar. 14, 1978, 53/28840

Int. Cl.[2] C07G 7/04

U.S. Cl. 424—177 6 Claims

1. A method for isolating an anti-mutagenic factor from cabbage juice, which comprises the steps of:

(a) centrifuging cabbage juice to remove particles of tissue including chloroplasts and mitochondria,

(b) ultracentrifuging the resultant supernatant to remove microsomes and ribosomes,

(c) contacting the resulting supernatant with an anion exchange cellulose to collect a fraction which has not been adsorbed onto said anion exchange cellulose,

(d) applying the resultant fraction to a column of a cation exchange cellulose,

(e) eluting the adsorbed substance with an aqueous eluant containing KCl or NaCl in a gradient concentration,

(f) retaining a fraction which has an absorbance peak at 280 nm containing said anti-mutagenic factor which is eluted at a KCl or NaCl concentration of 0.05 M,

(g) applying the resultant fraction onto a column of a molecular sieve, and

(h) eluting said column with a buffer at pH 8.0 and collecting a fraction containing an anti-mutagenic factor which strongly inhibits the reverse mutation of histadineless Salmonella TA98 to histadine non-requiring Salmonella TA98 induced by a mutagen.

5. Substantially pure anti-mutagenic factor consisting essentially of a hemoprotein isolated from cabbage juice and having, in its substantially pure form, a molecular weight of about 48,000 when determined by the sodium dedecylsulfate-gel electrophoresis, and the following amino acid composition in terms of molar percent:

Asp	13.22
Thr	8.43
Ser	6.70
Glu	6.38
Pro	6.56
Gly	7.22
Ala	9.89
Cys	1.73
Val	5.77
Met	1.29
Ileu	3.44
Leu	11.64
Tyr	1.31
Phe	5.36
Lys	2.59
His	1.07
Arg	7.40

said factor having characteristic absorptions at 280 nm and 404 nm as a Soret band which shifts to 436.5 nm when said factor is treated with sodium hydrosulfite.

4,191,753

ANTI-HYPERTENSIVE PEPTIDE ANALOGS

James W. Ryan, Miami, Fla., assignor to University of Miami, Miami, Fla.

Filed Nov. 6, 1978, Ser. No. 958,179

Int. Cl.[2] A61K 37/00; C07C 103/52

U.S. Cl. 424—177 15 Claims

1. A peptide comprising the amino acid sequence <Glu-Trp-A_3-Arg-A_5-Gln-Ile-A_8-A_9 wherein:

A_3 is L-Proline or L-3,4-dehydroproline,

A_5 is L-Proline or L-3,4-dehydroproline,

A_8 is L-Proline or L-3,4-dehydroproline,

A_9 is L-Proline or L-3,4-dehydroproline,

at least one of A_3, A_5, A_8 and A_9 is L-3,4-dehydroproline and all amino acids are in the L configuration.

4,191,754

BICYCLIC SOMATOSTATIN ANALOGS

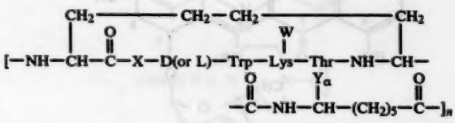
Daniel F. Veber, Ambler, and Ruth F. Nutt, Green Lane, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 28, 1979, Ser. No. 16,218

Int. Cl.[2] A61K 37/100; C07C 103/52

U.S. Cl. 424—177 10 Claims

1. The compound having the structure:



wherein

n is 1 or 2;

X is Phe or Tyr;

Y is H or COOH and

when Y is COOH, the carbon atom designated α in aminosuberyl is D- or L-;

W on the ε-amino group of lysine is independently selected from H or INOC, and non-toxic pharmaceutically acceptable salts thereof.

10. Compositions containing compounds of claim 1 and a pharmaceutically acceptable carrier.

4,191,755

NOVEL DAUNOMYCIN DERIVATIVES, THEIR AGLYCONES AND THE USE THEREOF

Paolo Masi; Antonino Suarato; Luigi Bernardi, all of Milan, and Federico Arcamone, Nerviano, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

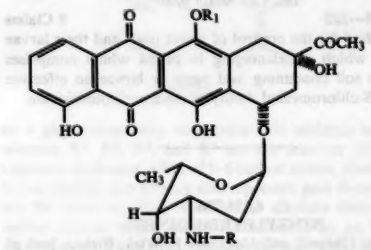
Filed May 1, 1978, Ser. No. 901,358

Claims priority, application United Kingdom, May 5, 1977, 18775/77

Int. Cl.[2] A61K 31/71; C07H 15/24

U.S. Cl. 424—180 5 Claims

1. A compound of the formula I:



I

wherein R_1 is a lower alkyl having from 1 to 4 carbon atoms and R is a hydrogen atom or a trifluoroacetyl group, and the hydrochlorides thereof.

4. A pharmaceutical composition comprising a therapeutically effective amount of a compound according to claim 1 and an inert carrier therefor.

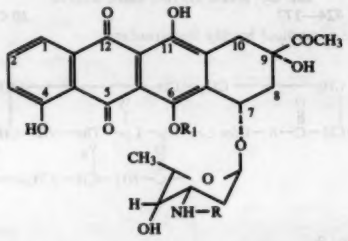
4,191,756

DAUNOMYCIN DERIVATIVES, THEIR AGLYCONES AND THE USE THEREOF

Paolo Masi; Antonino Suarato; Luigi Bernardi, all of Milan, and Federico Arcamone, Nerviano, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

Filed May 1, 1978, Ser. No. 901,359
Claims priority, application United Kingdom, May 5, 1977, 18777/77
Int. Cl.[2] A61K *31/71;* C07H *15/24*
U.S. Cl. 424—180 5 Claims

1. A compound of the formula I:



wherein R_1 is a lower alkyl having from 1 to 4 carbon atoms and R is a hydrogen atom or a trifluoroacetyl group, and the hydrochlorides thereof.

4. A pharmaceutical composition comprising a therapeutically effective amount of a compound according to claim 1, in combination with a carrier therefor.

4,191,757

5-CHLOROMETHYL DIETHYLPHOSPHOROTHIOLOTHIONATE AS A SOIL INSECTICIDE

Max Pianka, Wembley Park, England, assignor to The Murphy Chemical Company Limited, St. Albans, England

Continuation of Ser. No. 718,608, Aug. 30, 1976, abandoned, which is a continuation of Ser. No. 575,366, May 7, 1975, abandoned, which is a continuation of Ser. No. 401,692, Sep. 28, 1973, Pat. No. 3,896,219, which is a continuation of Ser. No. 169,875, Aug. 6, 1971, abandoned, which is a continuation of Ser. No. 842,291, May 13, 1969, abandoned. This application Nov. 9, 1977, Ser. No. 850,045
The portion of the term of this patent subsequent to Jul. 22, 1992, has been disclaimed.
Int. Cl.[2] A01N *9/36*
U.S. Cl. 424—225 9 Claims

1. A method for the control of insect pests and their larvae in the soil which are damaging to plants which comprises applying to soil containing said pests or larvae an effective amount of S-chloromethyl diethylphosphorothiolothionate.

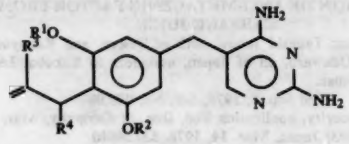
4,191,758

BENZYLPYRIMIDINES

Ivan Kompis, Oberwil, and Alexander E. Wick, Riehen, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Apr. 26, 1978, Ser. No. 900,358
Claims priority, application Luxembourg, May 5, 1977, 77268
Int. Cl.[2] A61K *31/505;* C07D *239/48*
U.S. Cl. 424—229 12 Claims

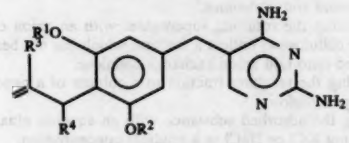
1. A compound of the formula



I

wherein R^1 and R^2, independently, are C_{1-3}-alkyl, and R^3 and R^4, independently, are hydrogen or methyl,
or a physiologically acceptable acid addition salt thereof.

10. An antibacterial pharmaceutical composition comprising a compound of the formula



I

wherein R^1 and R^2, independently, are C_{1-3}-alkyl, and R^3 and R^4, independently, are hydrogen or methyl,
or a physiologically acceptable acid addition salt thereof, an antibacterially active sulfonamide and a compatible pharmaceutical carrier material, said compound of formula I being present in an amount sufficient to potentiate the antibacterial activity of the sulfonamide.

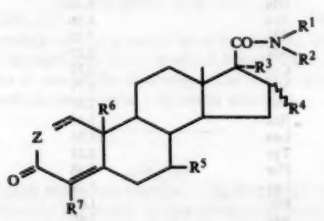
4,191,759

N-SUBSTITUTED-17β-CARBAMOYLANDROST-4-EN-3-ONE 5α REDUCTASE INHIBITORS

David B. R. Johnston, Warren, N.J., and Glen E. Arth, deceased, late of Cranford, N.J. (by Rose B. Arth), assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 13, 1978, Ser. No. 896,119
Int. Cl.[2] A61K *31/56;* C07J *9/00*
U.S. Cl. 424—242 11 Claims

1. A compound of the formula:



wherein

R^1 and R^2 are the same or different and each represents:
(1) hydrogen, provided that only one of R^1 and R^2 may be hydrogen (2) lower alkyl, (3) lower cycloalkyl, (4) phenyl, or

R^1 and R^2 taken together with the nitrogen to which they are attached represents a 5–6 membered saturated ring comprising up to one other heteroatom selected from oxygen and nitrogen;

R^3, R^4, R^5, and R^6 are the same or different and each represents:
(1) hydrogen, or (2) lower alkyl;

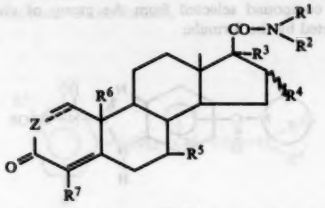
R^7 represents:
(1) hydrogen or (2) cyano;

Z represents:
CH—R^9

where R^9 is (a) hydrogen, (b) α-fluoro, or (c) α-lower alkyl;

and the dotted line between positions 1 and 2 represents the possibility of a single bond when Z is CH—R^9 and a double bond when Z is C—R^9.

5. A method of treating the hyperandrogenic conditions of acne vulgaris, seborrhea, male pattern baldness and female hirsuitism comprising topical administration to a patient in need of such treatment of a therapeutically effective amount of a compound of the formula:



wherein

R^1 and R^2 are the same or different and each represents: (1) hydrogen, provided that only one of R^1 and R^2 may be hydrogen, (2) lower alkyl, (3) lower cycloalkyl, (4) phenyl, or

R^1 and R^2 taken together with the nitrogen to which they are attached represents a 5–6 membered saturated ring comprising up to one other heteroatom selected from oxygen and nitrogen;

R^3, R^4, R^5, and R^6 are the same or different and each represents:

(1) hydrogen, or (2) lower alkyl;

R^7 represents:

(1) hydrogen or (2) cyano;

Z represents:

CH—R^9,

where R^9 is (a) hydrogen, (b) α-fluoro, or (c) α-lower alkyl;

and the dotted line between positions 1 and 2 represents the possibility of a single bond when Z is CH—R^9 and a double bond when Z is C—R^9.

4,191,760

DIBENZODIAZEPINES

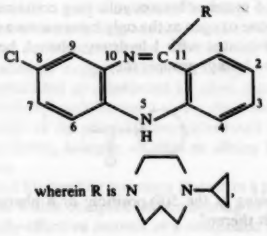
Bruce W. Horrom, and William D. Barta, both of Waukegan, Ill., assignors to Abbott Laboratories, N. Chicago, Ill.

Division of Ser. No. 771,215, Feb. 23, 1977, Pat. No. 4,096,261. This application Feb. 13, 1978, Ser. No. 877,205

Int. Cl.² A61K *31/55*; C07D *403/04*

U.S. Cl. 424—244 **8 Claims**

1. A compound of the structure



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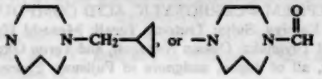
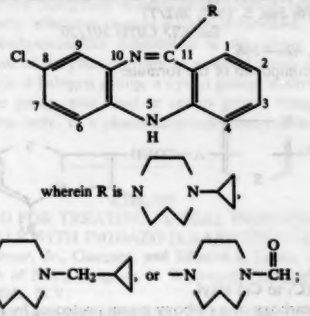


5. A composition of long lasting activity in the treatment of schizophrenics comprising as the active component an effective amount of a compound of the formula



and a pharmaceutically acceptable carrier.

4,191,761

COPPER COMPLEXES OF TETRAHYDROQUINOLINE DERIVATIVES HAVING ANTI-ULCER ACTIVITY

Roger Crossley, Reading, England, assignor to John Wyeth & Brother Ltd., Taplow, England

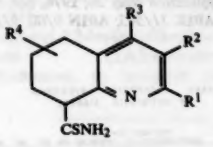
Filed Dec. 8, 1977, Ser. No. 858,482

Claims priority, application United Kingdom, Dec. 18, 1976, 52962/76

Int. Cl.² C07D *215/48*; A61K *31/47*

U.S. Cl. 424—245 **14 Claims**

1. A crystalline copper complex consisting essentially of copper (II), a pharmaceutically acceptable anion of water-soluble copper (II) salt and a tetrahydroquinoline compound of formula I



(I)

or a pharmaceutically acceptable acid addition salt thereof, wherein R^1, R^2, R^3, and R^4 are the same or different and represent hydrogen, alkyl of 1–6 carbon atoms, phenylloweralkyl or phenyl, and R^4 may also represent gem di-methyl or R^1 and R^2 taken together represent an alkylene chain of 3 to 5 carbon atoms, which may be substituted by an R^4 radical, provided that when any two of R^1, R^2, and R^3 are alkyl groups present on adjacent carbon atoms they are selected from normal and secondary alkyl groups.

8. A pharmaceutical composition for use in treatment of ulcers or hypersecretion comprising an effective amount of a copper complex as claimed in claim 1 and a pharmaceutical carrier.

4,191,762

2-LOWER ALKYL-7-SUBSTITUTED AMINO-2 OR 3-CEPHEM-4-CARBOXYLIC ACID COMPOUNDS

Takashi Kamiya, Suita; Tsutomu Teraji; Masashi Hashimoto, both of Toyonaka; Osamu Nakaguti, and Teruo Oku, both of Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

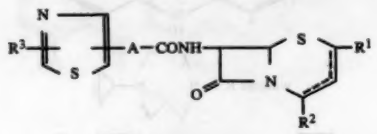
Continuation-in-part of Ser. No. 640,910, Dec. 15, 1975, Pat. No. 4,113,940, which is a continuation-in-part of Ser. No. 451,159, Mar. 14, 1974, abandoned. This application Jun. 21, 1977, Ser. No. 808,616

Claims priority, application United Kingdom, Jun. 28, 1976, 26740/76; Jan. 5, 1977, 262/77

Int. Cl.² C07D *501/20*

U.S. Cl. 424—246 13 Claims

1. A compound of the formula:



wherein

R^1 is (C_1 to C_6) alkyl,

R^2 is carboxy or a carboxy group protected by an eliminatable protective group, and

R^3 is amino or amino group protected by an eliminatable protective group and

A is carbonyl or hydroxy (C_1 to C_6) alkylene, and pharmaceutically acceptable salt thereof.

12. A pharmaceutical composition for the treatment of infectious disease caused by pathogenic bacteria comprising a compound of claim 1 or pharmaceutically acceptable salt thereof in association with a pharmaceutically acceptable, substantially non-toxic carrier or excipient.

4,191,763

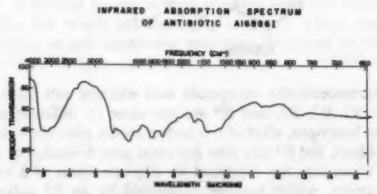
ANTIBIOTIC A16886 AND PROCESS FOR PRODUCTION THEREOF

Marvin Gorman; Calvin E. Higgens, and Ramakrishnan Nagarajan, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 62,390, Aug. 10, 1970, which is a continuation-in-part of Ser. No. 849,395, Aug. 12, 1969, abandoned. This application May 20, 1976, Ser. No. 688,212

Int. Cl.² A01K *31/545*; A01N *9/00, 9/12*

U.S. Cl. 424—246 2 Claims



1. A method for the inhibition of a plant-pathogenic bacterium which comprises applying to a plant exposed to the bacterium an amount of 7-(5-amino-5-carboxyvaleramido)-3-(carbamoyloxymethyl)-7-methoxy-3-cephem-4-carboxylic acid or a salt thereof which is effective to inhibit the growth of the bacterium.

4,191,764

5(6)-BENZENE RING SUBSTITUTED BENZIMIDAZOLE-2-CARBAMATE DERIVATIVES HAVING ANTHELMINTIC ACTIVITY

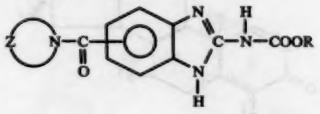
Colin C. Beard, Palo Alto, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 758,112, Jan. 10, 1977, Pat. No. 4,139,626, which is a continuation-in-part of Ser. No. 668,778, Mar. 19, 1976, abandoned. This application Sep. 29, 1978, Ser. No. 946,985

Int. Cl.² A61K *31/535*; C07D *295/18*

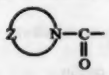
U.S. Cl. 424—248.55 16 Claims

1. A compound selected from the group of compounds represented by the formula:



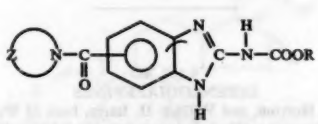
where R is a lower alkyl group having 1 to 4 carbon atoms;

is a saturated 6 membered heterocyclic ring containing only 1 nitrogen and 1 oxygen as the only hetero atoms and which is optionally substituted with 1 hydroxy, phenyl, benzyl or oxo radical or 1 or 2 alkyl groups; the



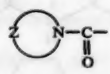
substitution being at the 5(6)- position; or a pharmaceutically acceptable salt thereof.

6. A composition for controlling helminths in mammals comprising a pharmaceutically acceptable non-toxic excipient and an anthelmintically effective amount of a compound selected from the group of compounds represented by the formula:



where R is a lower alkyl group of 1 to 4 carbon atoms;

is a saturated 6 member heterocyclic ring containing only one nitrogen and one oxygen as the only hetero atoms and which is optionally substituted with 1 hydroxy, phenyl, benzyl or oxo radical or 1 or 2 alkyl groups; the



substitution being at the 5(6)-position; or a pharmaceutically acceptable salt thereof.

4,191,765

1-ARYLOXY-2-HYDROXY-3-AMINOPROPANES

Werner Fritsch, Bad Soden am Taunus; Ulrich Stache, Hofheim am Taunus, and Ernst Lindner, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

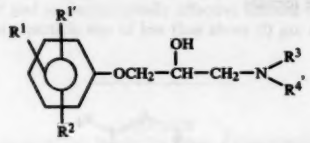
Continuation-in-part of Ser. No. 799,676, May 23, 1977, abandoned. This application Aug. 10, 1978, Ser. No. 932,504

Claims priority, application Fed. Rep. of Germany, May 25, 1977, 26233147

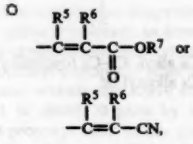
Int. Cl.[2] A61K *31/215, 31/275;* C07C *69/76, 121/80*

U.S. Cl. 424—248.53 6 Claims

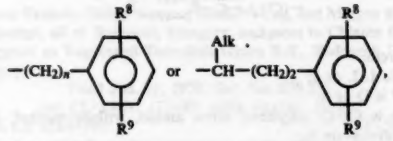
1. A compound of the formula



or a physiologically tolerable acid addition salt thereof, wherein R^1 and $R^{1'}$ are the same or different and are hydrogen, allyl, halogen, nitro, or alkyl or alkoxy having 1 to 4 carbon atoms; R^2 has the formula



wherein R^5 is hydrogen, alkyl having 1 to 5 carbon atoms, aryl, aryl-lower alkyl, or aryl or aryl-lower alkyl substituted by lower alkyl or alkoxy, R^6 is hydrogen or alkyl having 1 to 8 carbon atoms, and R^7 is hydrogen, lower alkyl, or aryl-lower alkyl; R^3, taken alone, is hydrogen; R^4, taken alone, is



wherein Alk is alkyl having 1 to 3 carbon atoms, n is a number from 1 to 3, R^8 and R^9, taken alone, are the same or different and are hydrogen, alkoxy having 1 to 3 carbon atoms, or benzyloxy, or R^8 and R^9, taken together, are bis-methylenedioxy; or R^3 and R^4, taken together with the nitrogen atom to which they are attached, are a heterocyclic ring having 5 to 7 members, or such a ring substituted by alkyl having 1 to 4 carbon atoms, or such a ring, unsubstituted or substituted by alkyl having 1 to 4 carbon atoms, wherein one carbon atom may be replaced by oxygen, sulfur, or nitrogen, which latter may be unsubstituted or substituted by alkyl, alkoxy, oxalkyl, acyl, or carbalkoxy each having 1 to 5 carbon atoms, by pyridyl, by phenyl, or by phenyl mono-substituted or poly-substituted by hydroxy, halogen, or alkyl or alkoxy having 1 to 4 carbon atoms.

5. A method for treating coronary disease in a patient suffering therefrom which comprises administering to said patient a therapeutically-effective amount of a compound as in claim 1.

4,191,766

METHOD FOR REDUCING IMMUNOLOGICAL RESPONSE

Paul L. Warner, Jr., Clarence, and Edward J. Luber, Jr., Buffalo, both of N.Y., assignors to Westwood Pharmaceuticals, Inc., Buffalo, N.Y.

Continuation-in-part of Ser. No. 756,640, Jan. 7, 1977, abandoned. This application Dec. 8, 1977, Ser. No. 858,512

Int. Cl.[2] A01N *9/22;* C07D *487/04*

U.S. Cl. 424—250 5 Claims

1. A method for reducing the immunological response in a mammal which comprises administering to said mammal a therapeutically effective amount of a 4-(substituted phenyl-)imidazo[1,2-a]quinoxaline substituted in the meta- and/or para-positions of the phenyl group by an alkyl group of 1 to 2 carbon atoms, a halogen group, a cyano group, a nitro group or an amino group, said nitro or amino groups being in the para- position only, in a pharmaceutically acceptable carrier therefor.

4,191,767

METHOD FOR TREATING FUNGAL INFECTION IN MAMMALS WITH IMIDAZO [1,2-A]QUINOXALINES

Paul L. Warner, Jr., Clarence, and Edward J. Luber, Jr., Buffalo, both of N.Y., assignors to Westwood Pharmaceuticals, Inc., Buffalo, N.Y.

Continuation-in-part of Ser. No. 757,640, Jan. 7, 1977, abandoned. This application Dec. 8, 1977, Ser. No. 858,513

Int. Cl.[2] A01N *9/22;* C07D *487/04*

U.S. Cl. 424—250 2 Claims

1. A method for inhibiting fungal growth comprising contacting a fungus sensitive thereto with an amount sufficient to inhibit the growth of such fungus of an imidazo[1,2-a]quinoxaline substituted at the 4-position by a hydrogen, an alkyl group of from 1 to 17 carbon atoms, 9-decenyl, a trifluoromethyl group, a benzyl group, a cycloalkyl group of from 4 or 6 carbon atoms, a styryl group, a phenyl group, and a phenyl group substituted by methyl, chloro, nitro or amino, in a suitable carrier therefor.

4,191,768

PENTADIENONE HYDRAZONES, METHOD FOR PREPARING THE SAME, AND INSECTICIDAL USE THEREOF

Thomas W. Drabb, Jr., Trenton, and James B. Lovell, Pennington, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Aug. 17, 1978, Ser. No. 934,441

Int. Cl.[2] A01N *9/20;* C07D *233/52*

U.S. Cl. 424—251 9 Claims

1. The compound 1,5-bis-[p-(trifluoromethoxy)phenyl]-1,4-pentadien-3-one (1,4,5,6-tetrahydro-5,5-dimethyl-2-pyrimidinyl)hydrazone, or inorganic acid addition salts thereof.

4,191,769

ISOTHIOUREA COMPOUNDS AND PHARMACOLOGICAL USE

Graham J. Durant; Charon R. Ganellin, both of Welwyn Garden City, and Rodney C. Young, Bengeo, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, United Kingdom

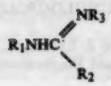
Division of Ser. No. 794,179, May 5, 1977, Pat. No. 4,109,003, which is a division of Ser. No. 551,220, Feb. 19, 1975, Pat. No. 4,036,971. This application Apr. 17, 1978, Ser. No. 896,846

Claims priority, application United Kingdom, Mar. 12, 1974, 10869/74

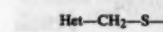
Int. Cl.[2] A61K *31/425, 31/44;* C07D *213/59, 277/30*

U.S. Cl. 424—263 7 Claims

1. A compound of the formula:



wherein R_1 represents a grouping of the structure



wherein Het is a nitrogen containing 5 or 6 membered heterocyclic ring selected from pyridine, thiazole, isothiazole, thiadiazole, isoxazole and triazole which is optionally substituted by lower alkyl, hydroxyl, halogen or amino; n is 2 or 3; R_2 is SR_4; R_3 is hydrogen, lower alkyl or R_1; and R_4 is lower alkyl, or a pharmaceutically acceptable acid addition salt.

7. A method of blocking histamine H_2-receptors, said histaime H_2-receptors being those histamine receptors which are not blocked by mepyramine but are blocked by burimamide, which comprises administering to an animal in need of blocking of said histamine H_2-receptors in an effective amount to block said histamine H_2-receptors a compound of claim 1.

4,191,770

N_1-ACYL-N_2-PHENYLDIAMINOPROPANOLS AND PHARMACEUTICAL COMPOSITIONS THEREOF

Hans Liepmann; Rolf Hueschens, both of Hanover; Wolfgang Milkowski, Burgdorf; Horst Zeugner; Henning Heinemann, both of Hanover; Klaus-Ulirich Wolf, Haenigsen; Insa Hell, and Reinhard Hempel, both of Hanover, all of Fed. Rep. of Germany, assignors to Kali-Chemie Pharma GmbH, Hanover, Fed. Rep. of Germany

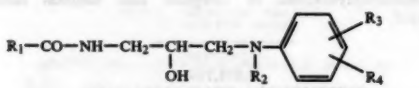
Filed Apr. 28, 1978, Ser. No. 900,998

Claims priority, application Fed. Rep. of Germany, May 10, 1977, 2720915; May 10, 1977, 2720968

Int. Cl.[2] C07D *213/56*; A61K *31/44*

U.S. Cl. 424—266 **17 Claims**

1. A compound selected from the group of N_1-acyl-N_2-phenyl-1,3-diaminopropan-2-ols having the formula I



(I)

wherein

R_1 represents pyridyl, or 2-furyl,

R_2 represents hydrogen, alkyl containing 1 to 3 carbon atoms, or methoxyethyl, and

R_3 and R_4 are the same or different from each other and each represent hydrogen, fluorine, chlorine, bromine, iodine, alkyl containing 1 to 3 carbon atoms, or alkoxy containing 1 to 3 carbon atoms; with exception of the compound of the formula I, if R_1 represents 2-furyl,

R_2 represents methyl,

R_3 represents hydrogen, R_4 represents 4-chlorine; and pharmaceutically acceptable acid addition salts thereof.

4,191,771

ANALGESIC METHOD USING 1,3,4-TRISUBSTITUTED-4-ARYLPIPERIDINES

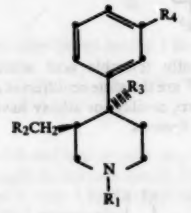
Dennis M. Zimmerman, Mooresville, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 905,494, May 12, 1978, which is a division of Ser. No. 852,252, Nov. 17, 1977, Pat. No. 4,115,400, which is a division of Ser. No. 690,767, May 27, 1976, Pat. No. 4,081,450, which is a continuation of Ser. No. 503,581, Sep. 6, 1974, abandoned. This application Mar. 12, 1979, Ser. No. 19,528

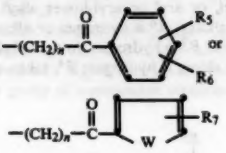
Int. Cl.[2] A61K *31/44, 31/445*

U.S. Cl. 424—267 **10 Claims**

1. A method of treating narcotic addition which comprises administering to a human an effective dose of a compound having the formula



wherein: R_1 is C_1–C_8 alkyl, C_4–C_8 (cycloalkyl)alkyl, benzyl, C_3–C_8 alkenyl, C_3–C_8 alkynyl or



wherein:

n is 1, 2, or 3;

W is O or S;

R_5 is C_1–C_3 alkylthio, nitro, amino, trifluoromethyl, hydroxy, or R_6;

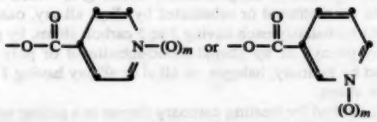
R_6 is hydrogen, C_1–C_3 alkyl, C_1–C_3 alkoxy, or halogen;

R_7 is hydrogen or methyl;

R_2 is hydrogen, C_1–C_4 alkyl, or C_2–C_6 alkenyl;

R_3 is C_1–C_4 alkyl or C_2–C_6 alkenyl; and

R_4 is hydrogen, hydroxy, C_1–C_3 alkoxy; C_1–C_{12} alkanoyloxy or



in which m is 0 or 1.

4,191,772

INSTILLATION COMPOSITION

Heinrich Woog, Laudenbach; and Werner Gruber, Birkenau; Werner Rothe, Hockenheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Feb. 24, 1978, Ser. No. 881,261

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1977, 2714065

Int. Cl.² A61K *31/435, 31/415, 31/44*

U.S. Cl. 424—273 R 4 Claims

1. An installation composition in the form of a low viscosity triglyceride oil-in-water emulsion consisting essentially of about 60 to 90% by weight of water, 10 to 30% by weight of the triglyceride oil, 0.3 to 3% by weight of a polysaccharide derivative swelling agent, 0.5 to 10% by weight of a non-ionic emulsifier and an antibacterially effective amount of nitrofurantoin of a particle size of less than about 10 μm suspended therein.

4,191,773

SYNERGISTIC INSECTICIDAL COMPOSITION

Silvia Dorn, Dielsdorf, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Nov. 17, 1978, Ser. No. 961,784

Claims priority, application Switzerland, Nov. 25, 1977, 14477/77

Int. Cl.² A01N *9/02*

U.S. Cl. 424—282 5 Claims

1. An insecticidal composition comprising inert carrier material and, as the active component, an amount of the combination of 2,3-(isopropylidenedioxy)phenyl-methyl carbamate and 2-nitro-4-chlorophenyl 2-propynyl ether which is effective as an insecticide and wherein the active component comprises from about 0.1 to about 10 parts by weight of 2-nitro-4-chlorophenyl 2-propynyl ether to one part by weight of 2,3-(isopropylidenedioxy)phenyl-methyl carbamate.

4,191,774

NOVEL 17-AZA-PGF$_{2\alpha}$ DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THE SAME

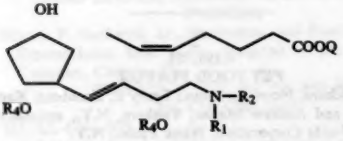
Istvan Szekely; Gabor Kovacs; Sandor Virag, and Matyas Szentivanyi, all of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T., Budapest, Hungary

Filed Jan. 18, 1978, Ser. No. 870,371

Int. Cl.² C07C *177/00;* A61K *31/195, 31/215*

U.S. Cl. 424—300 8 Claims

1. An optically active compound of the formula



(XII)

or a racemate thereof, wherein

R_1 is alkanoyl of one to 4 carbon atoms, alkanoyl of one to 4 carbon atoms substituted with halogen or benzyloxycarbonyl;

R_2 is alkyl of one to 4 carbon atoms;

R_4 is hydrogen; and

Q is hydrogen or a pharmaceutically acceptable non-toxic cation.

4,191,775

AMIDE DERIVATIVES

Alasdair T. Glen, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

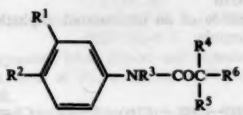
Filed Nov. 29, 1978, Ser. No. 964,726

Claims priority, application United Kingdom, Dec. 15, 1977, 52223/77

Int. Cl.² A61K *31/165, 31/275;* C07C *103/127, 121/78*

U.S. Cl. 424—304 9 Claims

1. An acylanilide of the formula:



wherein R^1 is cyano, nitro, trifluoromethyl, chloro, bromo, iodo, hydrogen or alkyl of up to 4 carbon atoms;

wherein R^2 is cyano, nitro, trifluoromethyl, chloro, bromo or iodo;

wherein R^3 is hydrogen or alkyl of up to 4 carbon atoms;

wherein R^4 is alkyl of up to 4 carbon atoms;

wherein R^5 is trifluoromethyl, difluoromethyl or monofluoromethyl;

and wherein R^6 is hydrogen, hydroxy, halogen, alkyl or alkoxy each of up to 4 carbon atoms, arylalkoxy of up to 10 carbon atoms or alkanoyloxy of up to 15 carbon atoms.

9. A method of producing an antiandrogenic effect in a warm-blooded animal in need of such an effect which comprises administering to said animal an effective amount of an acylanilide claimed in claim 1.

4,191,776

BIPHENYL DERIVATIVES

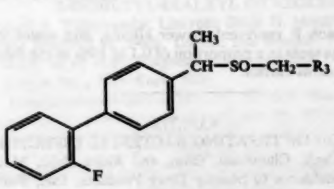
Josef Nickl; Erich Muller, both of Biberach/Riss; Berthold Narr, Mettenberg; Walter Haarmann, Biberach/Riss; Wolfgang Schroter, Biberach/Riss, and Rudolf Kadatz, Biberach/-Riss, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 711,953, Aug. 5, 1976, abandoned, which is a continuation-in-part of Ser. No. 577,169, May 14, 1975, Pat. No. 3,993,683. This application Nov. 18, 1977, Ser. No. 852,714

Int. Cl.² C07C *147/107, 147/14;* A61K *31/44, 31/235*

U.S. Cl. 424—308 5 Claims

1. A diastereoisomer or optically active antipode of a compound of the formula



wherein R_3 is (alkoxy of 1 to 6 carbon atoms)-carbonyl.

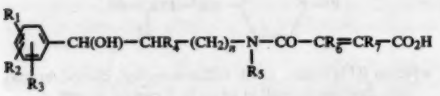
4. An antithrombotic pharmaceutical composition consisting essentially of an inert pharmaceutical carrier and an effective antithrombotic amount of a compound of claim 1.

4,191,777
MALEIC ACID HALFAMIDES HAVING BLOOD PRESSURE RAISING ACTIVITY

Karl H. Kingler, Lagen; Klause Thiemer, Hanau, and Fritz Stroman, Offenbach, all of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Dec. 13, 1978, Ser. No. 969,068
Claims priority, application United Kingdom, Dec. 16, 1977, 52422/77
Int. Cl.[2] A61K *31/19, 31/205;* C07C *101/20*
U.S. Cl. 424—316 37 Claims

1. A half amide of an unsaturated aliphatic dicarboxylic acids of the formula:



where R_1, R_2 and R_3 are the same or different and are hydrogen, halogen, a hydroxy group, a methyl group or a methoxy group or two of these together are a methylenedioxy group, R_4 is hydrogen or a methyl group, R_5, R_6 and R_7 independently are hydrogen or C_1–C_4 alkyl groups and n is 0 or 1, or a salt of a compound of formula I with a pharmaceutically acceptable metal, ammonia or a pharmaceutically acceptable organic basically reacting compound, with the proviso that when the compound of formula I is not in the salt form it is not N-[2-(3'-hydroxyphenyl)-2-hydroxyethyl]-maleic acid monoamide.

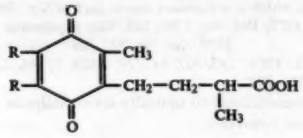
36. A process comprising administering to a mammal an amount of a compound according to claim 1 effective to increase the blood pressure of the mammal.

4,191,778
AQUEOUS IMMUNOREGULATORY AGENT

Yuichi Yamamura, Takarazuka; Ichiro Azuma, Suita; Kazuhisa Sugimura, Toyonaka; Hiroshi Morimoto, Nishinomiya; Isuke Imada, Izumi, and Masazumi Watanabe, Kawanishi, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Feb. 7, 1977, Ser. No. 766,505
Claims priority, application Japan, Feb. 10, 1976, 51-13584
Int. Cl.[2] H61K *31/19*
U.S. Cl. 424—317 8 Claims

1. An aqueous immunoregulatory agent containing a physiologically acceptable water-soluble alkali metal or amine salt of a quinonyl acid derivative of the formula



wherein each R represents lower alkoxy, said water-soluble salt being present in a proportion of 0.1 to 10% as the free acid, and an aqueous carrier.

4,191,779
METHOD OF TREATING BACTERIAL INFECTIONS

Elton S. Cook, Cincinnati, Ohio, and Akira Fujii, Matsudo, Japan, assignors to Stanley Drug Products, Inc., Portland, Oreg.

Filed Mar. 17, 1978, Ser. No. 887,648
Int. Cl.[2] A61K *31/195*
U.S. Cl. 424—319 5 Claims

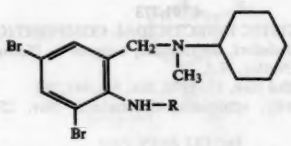
1. A method of treating bacterial infections in mammals comprising administering to a mammal suffering from said bacterial infection an antibacterial effective amount of a para substituted benzoic acid wherein the para substituent is selected from the group consisting of —$NHC(NH)NH_2$, —CH_2NH_2, —$CH_2NHC(NH)NH_2$, —$(CH_2)_2NH_2$, and —$(CH_2)_2NHC(NH)NH_2$.

4,191,780
BROMHEXINE DERIVATIVES AND PROCESS FOR MAKING SAME

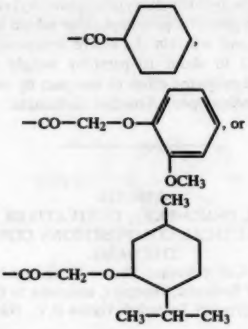
Carlo Tosi, Nimis, Italy, assignor to Instituto Franco Tosi S.p.A., Milan, Italy

Filed Oct. 16, 1978, Ser. No. 952,589
Claims priority, application Italy, May 29, 1978, 23931 A/78
Int. Cl.[2] A61K *31/165;* C07C *103/37, 103/19, 103/75*
U.S. Cl. 424—324 3 Claims

1. A compound selected from the group consisting of those of the formula



wherein R is



and the acid addition salts thereof.

3. Pharmaceutical composition comprising an antitussive effective amount of a compound of formula I in claim 1 or its acid addition salt in a pharmaceutically acceptable carrier.

4,191,781
PET FOOD FLAVOR

Robert E. Schara, Norwalk, Conn.; Larry E. Keenberg, Kankakee, Ill., and Andrew Makar, Yonkers, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Sep. 30, 1977, Ser. No. 838,411
Int. Cl.[2] A23K *1/00*
U.S. Cl. 426—2 10 Claims

1. A process for improving the palatability of a dog food comprising incorporating into the dog food an amount of ammoniated glycyrrhizin which is effective to increase the palatability of a dog food, said amount depending on the sucrose content of the dog food and being in accordance with the following table:

Sucrose (Wt. %)	Ammoniated Glycyrrhizin (PPM)
21–25	100–400
16–21	100–300
13–16	25–250
10–13	25–175
8–10	25–150
6–8	25–100
4–6	25–75
2–4	25

4,191,782

METHOD FOR DIACETYL FLAVOR AND AROMA DEVELOPMENT IN CREAMED COTTAGE CHEESE

Ebenezer R. Vedamuthu, Bradenton, Fla., assignor to Microlife Technics, Inc., Sarasota, Fla.

Continuation-in-part of Ser. No. 639,052, Dec. 9, 1975, abandoned, and Ser. No. 712,692, Aug. 9, 1976. This application Sep. 14, 1977, Ser. No. 833,082

Int. Cl.[2] A23C *19/02*

U.S. Cl. 426—38 **10 Claims**

1. The method of providing improved diacetyl flavor and aroma in creamed Cottage cheese by adding thereto a concentrate of *Streptococcus diacetylactis* which is not mechanically concentrated to develop the flavor at refrigeration temperatures, said method consisting essentially of:

(a) providing an aqueous growth medium containing as solids dispersed or dissolved in water, non-fat milk or milk casein digest or mixtures thereof, a yeast material containing amino acid and other essential growth factors for *Streptococcus diacetylactis*, a citrate, and separately added lactose all of which can be metabolized by *Streptococcus diacetylactis* cells, the solids being present in an amount less than about 0.25 part per part of the aqueous medium;

(b) inoculating and then growing *Streptococcus diacetylactis* cells in the growth medium at a temperature and for a time to increase the number of cells in the medium to above 10×10^9 cells per ml of medium while adjusting the pH between 6.0 and 7.0 to produce a cell concentrate containing above said 10×10^9 cells per ml and without further concentrating the number of cells in the medium, freezing the medium to obtain a frozen cell concentrate for storage and shipment;

(c) thawing the frozen cell concentrate; and

(d) mixing the thawed cell concentrate in creamed Cottage cheese in an amount to provide between about 10^5 and 10^8 *Streptococcus diacetylactis* cells per gram of Cottage cheese whereby there is developed a desirable diacetyl flavor and aroma upon storage of the creamed cottage cheese at refrigeration temperatures.

4,191,783

SHELF STABLE, HIGH MOISTURE FOOD AND PROCESS

Morris P. Burkwall, Jr., Barrington, and Penelope L. Gould, Crystal Lake, both of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Nov. 4, 1977, Ser. No. 848,503

Int. Cl.[2] A23J *1/02*

U.S. Cl. 426—335 **20 Claims**

1. In a process of stabilizing a food against microbiological decomposition wherein the food comprises foodstuff and a stabilizing mixture, the improvement comprising:

(a.) forming a foodstuff having a moisture content of from 51 to 65 percent by weight moisture, and a water activity of 0.91 to 0.95;

(b.) admixing:

I. a stabilizing mixture consisting essentially of a sufficient amount of an acidic compound selected from the group consisting of acid, acid salt, and mixtures thereof to lower the pH to 4.0 to 6.8, and 2 to 19 percent polyhydric alcohol being at least one selected from the group consisting of propylene glycol and 1,3-butanediol; the amounts of acidic compound and polyhydric alcohol being selected according to the sole FIGURE of the Drawing; and

II. the foodstuff to form an admixture;

(c.) cooking and shaping said admixture at a temperature of 60° to 120° C. to form a stabilized food.

4,191,784

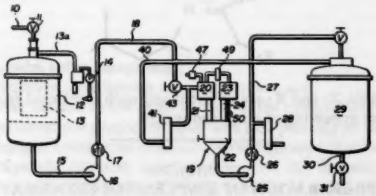
METHOD FOR PREPARING A CARBONATED BEVERAGE

Harry G. Mojonnier, River Forest, and Sigmund P. Skoli, Elmwood Park, both of Ill., assignors to Mojonnier Bros. Co., Chicago, Ill.

Division of Ser. No. 821,215, Aug. 2, 1977, Pat. No. 4,112,828, which is a continuation of Ser. No. 654,596, Feb. 2, 1976, abandoned. This application May 30, 1978, Ser. No. 910,184

Int. Cl.[2] C02D *1/04*; A23L *2/38*

U.S. Cl. 426—475 **2 Claims**



1. A method of preparing a beverage from a syrup and water containing dissolved air, comprising the steps of leading a quantity of water from a remote source through a check valve to a proportioner device through a first conduit at a relatively low pressure, mixing the water with syrup in the proportioner to form an uncarbonated beverage mix, leading the beverage mix from the proportioner to a carbonator, introducing an excess of carbon dioxide gas to the beverage mix, mixing the carbon dioxide gas and the beverage mix in the carbonator to form a carbonated beverage end product at a relatively high pressure, leading undissolved carbon dioxide gas at a high pressure from the carbonator to the first conduit, mixing the high pressure carbon dioxide gas and the low pressure water at a mixing point in the first conduit downstream of the check valve and upstream of the proportioner so as to drive dissolved air from the water and replace the air with the carbon dioxide gas, and exhausting removed air and undissolved carbon dioxide gas from the system at a point downstream of said mixing point and upstream from the carbonator.

4,191,785

FLAVORING WITH MIXTURES OF 2,4,6-TRIISOBUTYL-1,3,5-TRIOXANE AND 2-ISOBUTYL-DIALKYL OXAZOLINES

Donald A. Withycombe, Lincroft; Braja D. Mookherjee, Holmdel; Manfred H. Vock, Locust, and Joaquin F. Vinals, Red Bank, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 887,626, Mar. 17, 1978, abandoned, which is a division of Ser. No. 807,056, Jun. 16, 1977, Pat. No. 4,093,752. This application Jul. 27, 1978, Ser. No. 928,716

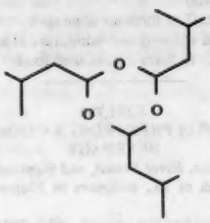
The portion of the term of this patent subsequent to Jun. 6, 1995, has been disclaimed.

Int. Cl.[2] A23L *1/226, 1/234*

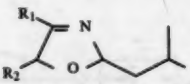
U.S. Cl. 426—536 **2 Claims**

2. A process for augmenting or enhancing the aroma or taste of a foodstuff comprising the step of adding to said foodstuff from 5.0 parts per million up to about 100 parts per million

based on the total weight of foodstuff of a mixture of isobutyl substituted heterocyclic compounds which mixture comprises (a) 2,4,6-triisobutyl-1,3,5-trioxane having the formula:



and (b) a mixture of oxazoline compounds having the generic structure:



wherein R_1 and R_2 are different and each is selected from the group consisting of ethyl and methyl.

4,191,786

PREPARATION OF DISPERSIBLE CHOCOLATE LIQUOR BY EXTRUSION

Bernard H. Nappen, Cranford, and Nicholas G. Marotta, Green Brook, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Jul. 3, 1978, Ser. No. 921,528
Int. Cl.[2] A23G *1/00*; A23L *2/38*
U.S. Cl. 426—593 **5 Claims**

1. A process for preparing dispersible chocolate liquor which consists essentially of the steps of:

a. mixing melted chocolate liquor and starch, in a ratio of melted chocolate liquor to starch of from 10:2.5 to 10:15, with from 5 to 25%, by total weight of the mixture, of water;

b. passing the mixture through a heated extruder at an elevated pressure and temperature within the range of 110°–135° C. for a period of time sufficient to partially hydrate the starch; and

c. extruding the mixture through an orifice.

4,191,787

PROCESS FOR PREPARING A PASTEURIZED MEAT-CONTAINING SALAD

Julius F. Bauermann, Chalfont, Pa., assignor to Horace W. Longacre, Inc., Franconia, Pa.

Filed Jul. 24, 1978, Ser. No. 927,650
Int. Cl.[2] A23L *1/212*
U.S. Cl. 426—615 **10 Claims**

1. A process for preparing a pasteurized meat and vegetable containing salad having a long shelf-life under refrigeration, said process consisting essentially of the following sequential steps:

(a) preparing a meat-containing salad by mixing the meat with vegetables and any other ingredients;

(b) subjecting said salad to an acid treatment by adding thereto a food grade acidulant in a sufficient amount to obtain a salad pH in the range of about 4.2 to 4.6;

(c) then rapidly raising the internal temperature of the acid-treated salad to a temperature greater than about 150° F. and less than about 170° F.; and

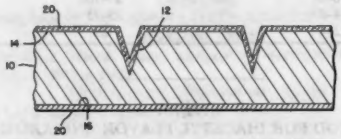
(d) immediately allowing the salad to cool.

4,191,788

METHOD TO REDUCE BREAKAGE OF V-GROOVED <100> SILICON SUBSTRATE

Alan L. Harrington, Glendale, Calif., assignor to TRW Inc., Los Angeles, Calif.

Filed Nov. 13, 1978, Ser. No. 959,519
Int. Cl.[2] H01L *21/461*
U.S. Cl. 427—82 **7 Claims**



1. A method for passivating and supporting a V-grooved substrate wafer of silicon for future processing comprising the production of a thin polycrystalline intrinsic silicon layer, of approximately 7 to 10μ thickness, on the top and bottom sides of the wafer.

4,191,789

FABRICATION OF BI-LEVEL CIRCUITS

John F. Brown, Emmaus, and Robert M. Stanton, Allentown, both of Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 2, 1978, Ser. No. 956,885
Int. Cl.[2] H05K *1/04, 1/08*
U.S. Cl. 427—97 **14 Claims**

1. A method of fabricating bi-level circuits including metallizing holes (14 and 15) through an insulating substrate (10) comprising the steps of: depositing a thick film paste (13) onto one major surface (12) of said substrate and filling said holes, said paste including a material selected from the group consisting of a metal and metal oxide, and an organic vehicle comprising a binder and at least one solvent; heating the resulting structure to evaporate the solvent; and firing the remaining paste material to establish a desired conductivity CHARACTERIZED IN THAT the structure is heated with the deposited surface down to create a solvent concentration gradient in the paste filling the holes during heating so that the bulk of the paste accumulates in the holes near the surface (11) opposite the deposited surface to form contact pads (16) at the opposite surface and the remaining paste coats the walls of the holes near the deposited surface.

4,191,790

ABRASION RESISTANT POLYESTER CARBONATES

Daniel C. Chung, Edison, and Dusan C. Prevorsek, Morristown, both of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 842,754, Oct. 17, 1977, abandoned. This application Aug. 8, 1978, Ser. No. 931,652
Int. Cl.[2] B05D *5/06, 3/02*
U.S. Cl. 427—164 **2 Claims**

1. Process of producing a substantially clear, abrasion resistant, impact resistant composite article which comprises forming, on a substrate of polyester-carbonate copolymer wherein the ester segments of the molecules are composed of bisphenol-A moieties and aromatic dicarboxyloyl moieties, predominantly terephthaloyl, in mole ratio in the range between 2:05

and 2:1.3 of bisphenol-A:dicarboxyloyl moieties, a layer of monomeric allyl diglycol carbonate, containing free radical-forming polymerization initiator active at temperature of 50° C.; and maintaining such substrate and the allyl diglycol carbonate layer thereon under free radical catalyzed polymerization conditions, free of elemental oxygen and at temperatures maintained in the range between 40° and 50° C. during at least the first 1 hour of the polymerization period and thereafter raised over at least 3 hours in at least 2 stages to at least 100° C. for a time at least sufficient to polymerize the allyl diglycol carbonate to the extent of producing an abrasion resistant surface.

4,191,791

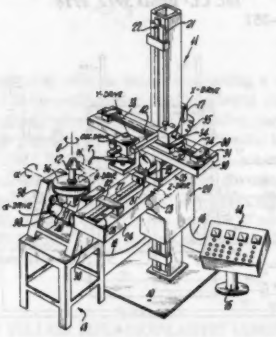
METHOD OF APPLYING A METAL COATING TO A METAL SUBSTRATE

John E. Lyons, Levittown, N.Y., assignor to Eutectic Corporation, Flushing, N.Y.

Division of Ser. No. 736,840, Oct. 29, 1976, Pat. No. 4,089,293. This application Oct. 21, 1977, Ser. No. 844,381

Int. Cl.² B05D *1/08, 3/08*

U.S. Cl. 427—224 **5 Claims**



1. The method of using a gas torch to apply a smooth and continuous metal coating along a predetermined path on a surface of a metal substrate, which method comprises igniting the torch and directionally applying its discharge to a local region of said path, oscillating said discharge in a regular periodic traverse sweep of said path, continuously advancing said discharge along said path at a relatively slow rate compared to that of the oscillating traverse sweep, and intermittently adding metal powder to the torch flow in synchronism with the oscillating sweep cycle, said last step occurring in a regular pattern in which single powder-spraying sweeps involving metal-powder addition to the torch flow are spaced by full-sweep intervals of the sweep cycle without metal-powder addition, the relatively slow rate of advance along said path and the interval between successive powder-spraying sweeps being selected such that the bead of sprayed metal on the substrate for each successive powder-spraying sweep at least partially overlaps the previously sprayed bead, whereby the sweep intervals without metal-powder addition are fusing sweeps which enhance the smooth and continuous nature of the resultant metal coating and its bond to the metal substrate.

4,191,792

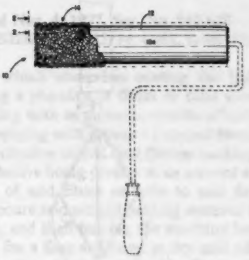
PAINT ROLLER

Robert I. Janssen, St. Paul, Minn., assignor to Padco, Inc., Minneapolis, Minn.

Filed Oct. 30, 1978, Ser. No. 955,918

Int. Cl.² B05D *5/02*; B05C *17/02*; B05D *1/28*

U.S. Cl. 427—260 **15 Claims**



1. A paint roller comprising:

a cylindrical core having an outer surface; and

a cover bonded to the outer surface of the cylindrical core, the cover comprising an open web of a plurality of interengaged continuous crinkled coarse filaments of resilient polymeric material, and a coating over the filaments to permanently bond the filaments together at points where they touch, to form a plurality of open loop elements having substantial interstitial open areas wherein the cover has inner and outer surfaces with portions of the cover proximate the inner surface having a higher concentration of filaments than portions proximate the outer surface, and wherein the inner surface is bonded to the outer surface of the cylindrical core.

12. A method of forming paint rollers, the method comprising:

providing a cylindrical core having inner and outer surfaces and having a length greater than a desired paint roller length;

bonding, with a two part epoxy, an open web of a plurality of interengaged continuous crinkled coarse filaments of resilient thermoplastic polymeric material bonded together at points where they touch to form a plurality of open loop elements having substantial interstitial open areas spirally to the outer surface of the cylindrical core, wherein the open web has first and second major surfaces with portions of the web proximate the first major surface having a higher concentration of filaments than portions proximate the second major surface, and wherein the first major surface is bonded to the outer surface of the cylindrical core; and

cutting, from the core having the open web bonded thereto, paint rollers of the desired paint roller length.

15. A method of producing a texture surface with texture paint material, the method comprising:

applying texture paint material to a texture paint roller having a cylindrical core and a cover bonded to its outer surface, the cover comprising an open web of a plurality of interengaged continuous crinkled coarse filaments of resilient material which are bonded together at points where they touch to form a plurality of open loop elements having substantial interstitial open areas; and

applying the texture paint material to a surface by rolling the texture paint roller over the surface, the open loop elements creating surface texture effects in the applied texture paint material as the texture paint roller is rolled.

4,191,793

METHOD OF FORMING A DURABLE CREASE

James D. M. Gibson, Ilkley, and Paul Hageman, Bradford, both of England, assignors to Wool Development International Limited, London, England

Continuation of Ser. No. 841,672, Oct. 13, 1977, abandoned.
This application May 17, 1978, Ser. No. 907,058
Int. Cl.[2] A41D 1/10
U.S. Cl. 427—276 1 Claim

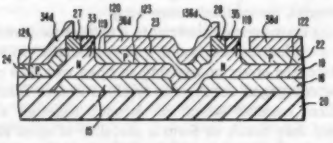
1. A method for producing durable creases in a pair of trousers which comprises:
providing at least one elongated support structure of dimensions to fit within and at least the length of a trouser leg;
providing said structure, on each opposed upper and lower face, with a channel adapted to receive a preformed crease of a said trouser leg;
providing said support structure with a rotatable mounting so that the position of said faces may be reversed;
turning the pre-creased legs of a said trouser inside out and positioning one said turned leg on said structure whereby the length of the apex of the upper located creases lies within the associated channel;
providing the dispenser head with a slot operatively conforming to the received crease of the turned leg;
operatively associating said dispenser with the positioned leg and traversing said crease to dispense said resin therein;
rotating said support structure 180° whereby to present the opposed crease to said dispenser and dispensing said resin along the length of said opposed crease;
removing said leg from the support structure; and
turning said leg inside out; and
folding the leg flat and curing the resin whereby to form said durable crease.

4,191,794

INTEGRATED SOLAR CELL ARRAY

Fred A. Shirland, and William J. Biter, both of Murrysville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 11, 1978, Ser. No. 905,068
Int. Cl.[2] B05D 5/12; H01L 31/06
U.S. Cl. 427—74 8 Claims



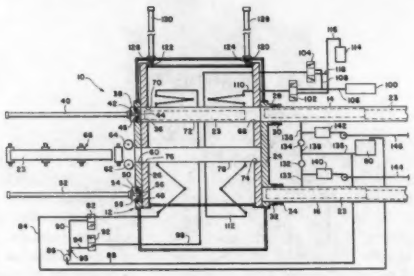
1. A method for making an array of series coupled photovoltaic cells comprising the steps of:
(a) forming a first array comprising a first plurality of parallel isolated electrically conductive members on an electrically insulating surface, each of said individual members serving as a first electrode of a single cell of said array;
(b) forming a layer of semiconductor material of a first conductivity type overlying and affixed to said substrate and to said electrically conductive members;
(c) forming a second array comprising a second plurality of parallel isolated electrically conductive members affixed to the top surface of said semiconductor layer, each individual member comprising said second array serving as a second electrode of a cell of said array and solely overlapping an edge of a single individual member of said first array but spaced therefrom and electrically coupled thereto by said semiconductor layer;
(d) forming a plurality of isolated regions of semiconductor material of a second conductivity type each having an interface with said semiconductor layer with the PN junctions formed at said interface comprising the active junctions of said array of photovoltaic cells;
(e) forming a plurality of current collector grids each comprising a plurality of electrically conductive members, each region of said plurality of isolated regions of semiconductor material of a second conductivity type having a current collector grid formed thereon and electrically connected to an adjacent member of said second electrode array.

4,191,795

METHOD AND MEANS FOR TREATING TIMBERS

Jesse M. Lewis, 4410 S. Mingo Rd., Tulsa, Okla. 74145

Filed Aug. 24, 1978, Ser. No. 936,619
Int. Cl.[2] B05D 3/12, 1/18
U.S. Cl. 427—351 21 Claims



1. A method for treating timbers comprising the steps of conveying individual timbers in succession to a treating station, inserting individual timbers into a carrier, transporting the timbers independently in the carrier into the proximity of a treating chamber having a treating fluid contained therein, ejecting the timber from the carrier for insertion into the treating chamber, repeating the operation with successive timbers whereby each timber inserted into the treating chamber abuts the end of the preceding timber for moving the timbers longitudinally through the treating chamber, ejecting the treated timbers individually from the treating chamber and inserting the said treated timbers individually into a second carrier, moving the carrier into the proximity of a drying chamber, ejecting the treated timber from the second carrier and inserting the timber into the drying chamber, repeating the operation with successive timbers whereby each timber inserted into drying chamber abuts the end of the preceding timber for moving the timbers longitudinally through the drying chamber, removing the dried timbers individually from the drying chamber, and releasing the treated and dried timbers for storage.

4,191,796

METHOD OF PREVENTING PEEL OF OLD PAINT

Paul S. Eckhoff, R.F.D. #1, Moor's Hill Rd., Syosset, N.Y. 11791

Filed Oct. 23, 1978, Ser. No. 953,737
Int. Cl.² B05D 1/36, 7/00
U.S. Cl. 427—408 1 Claim

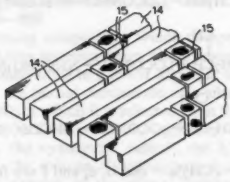
1. A method for preventing the peeling of old paint from a wooden substrate when a latex paint is applied thereto comprising the step of first applying to the old paint a composition consisting essentially of an aqueous resin binder formed by blending (1) an aqueous alkaline emulsion of a polyurethane resin based on a drying oil and (2) an aqueous dispersion of a thermoplastic acrylic polymer.

4,191,797

HEAT AND ELECTRICAL RESISTANT TABLE AND BENCH TOP AND METHOD OF MAKING SAME

Glenn L. Hayward, Jim Falls, Wis., assignor to Burd, Inc., St. Charles, Ill.

Filed Feb. 22, 1979, Ser. No. 14,094
Int. Cl.² B32B 7/12
U.S. Cl. 428—50 11 Claims



1. An industrial table or bench top having a work surface resistant to high temperatures and electrical current which comprises a core of longitudinally extending wood blocks in side by side and end to end relation, adhesive bonds uniting said blocks into the form of a planar slab, a bottom sheet of plastics material bonding particle board covering the bottom face of said planar slab, a top sheet of plastics material bonded laminar cotton fabric covering the top face of said planar slab, and cold setting glue bonds uniting said top and bottom sheets to said planar slab.

4,191,798

HIGHLY FILLED THERMOPLASTIC COMPOSITIONS BASED ON ETHYLENE INTERPOLYMERS AND PROCESSING OILS

Frederick G. Schumacher, Wilmington, Del., and Walter Yllo, Carneys Point, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 22, 1978, Ser. No. 963,111
Int. Cl.² B32B 27/30
U.S. Cl. 428—95 20 Claims

1. A composition consisting essentially of (a) from about 5 to about 50% by weight of at least one copolymer of ethylene with at least one comonomer selected from the group consisting of vinyl esters of saturated carboxylic acids wherein the acid moiety has up to 4 carbon atoms, unsaturated mono- or dicarboxylic acids of 3 to 5 carbon atoms, and esters of said unsaturated mono- or dicarboxylic acids wherein the alcohol moiety has 1 to 8 carbon atoms, the ethylene content of said copolymer being from about 60 to about 90% by weight, the comonomer content of said copolymer being from about 10 to about 40% by weight, and the melt index of said copolymer being from about 0.1 to about 150, provided that when said copolymer of ethylene is an ethylene/vinyl ester copolymer said copolymer can contain up to about 15% by weight of carbon monoxide or sulfur dioxide; (b) from about 2 to about 15% by weight of processing oil; and (c) from about 50 to about 90% by weight of filler.

4,191,799

BONDING CARPET BACKING USING A LATEX EXTENDED WITH GRAFTED MINERAL OIL

David P. Gruber, Northampton Township, Summit County, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Filed Nov. 4, 1977, Ser. No. 848,625
Int. Cl.² B32B 25/10, 25/14; C08L 9/08, 51/00
U.S. Cl. 428—96 10 Claims

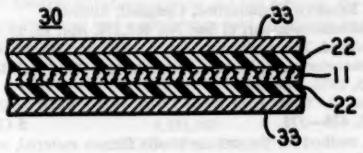
1. A method which comprises coating the backing of a carpet comprising a plurality of fibers or tufts woven with a first fibrous backing with an aqueous curable adhesive composition and then applying with pressure a second fibrous backing material to said adhesive coated first fibrous backing to form a laminate, said adhesive being present in an amount sufficient to secure the ends of said fibers or tufts to said first backing material and to secure said second backing material to said first backing material, and then heating the resulting laminate at a temperature and for a time sufficient to dry said adhesive and said secondary backing and to cure said adhesive to bind the ends of the fibers or tufts of said carpet to said primary backing and said primary backing to said secondary backing together into a unitary laminate without adversely affecting the fibers or tufts of said carpet, said adhesive in said composition comprising a blend of a polymer and a minor amount by weight of extender for said polymer, said extender comprising a mineral oil containing, per 100 parts by weight of said oil, graft polymerized to said oil from about 2 to 20 parts by weight of an ethylenically unsaturated monomer having from 2 to 16 carbon atoms and said polymer being a copolymer of a diene selected from the group consisting of butadiene, isoprene and 2,3-dimethyl butadiene and at least one copolymerized monomer selected from the group consisting of acrylic acid, methacrylic acid, maleic acid, maleic anhydride, fumaric acid, itaconic acid, vinyl benzoic acid, α-chloro acrylic acid and crotonic acid.

4,191,800

DEVICES EMPLOYING FLEXIBLE SUBSTRATES AND METHOD FOR MAKING SAME

Kenneth A. Holtzman, Clifton, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 690,735, May 27, 1976, abandoned.
This application Jul. 26, 1978, Ser. No. 928,067
Int. Cl.² B32B 27/12, 17/10
U.S. Cl. 428—251 8 Claims



1. A process for the fabrication of electronic circuits with flexible substrates comprising the steps of

a. impregnating a cloth-mat material with an epoxy resin-hardener composition free from solvent,

b. adhering a copper sheet to both sides of the impregnated cloth-mat material to form a double-sided clad flexible substrate,

c. curing the double-sided clad flexible substrate by heating, characterized in that epoxy resin-hardener composition consists essentially of, in parts by weight,

Epoxy Resin	100

-continued

Antimony Oxide	0–80
Chlorinated Hydrocarbon	
Flame Retardant	0–160
Maleic Anhydride Adduct of	
Methylcyclopentadiene	68–95
Carboxy Terminated	
Butadiene-Acrylonitrile	69–107
2,4,6 tri(dimethylaminomethyl)	
Phenol	0.5–3.0
Antioxidant	0.1–6.0

and the impregnated cloth is cured at a temperature between 150 and 180 degrees C. for a time between 24 and 96 hours.

4,191,801

HOT MELT METAL WORKING LUBRICANTS

Richard W. Jahnke, Mentor-on-the-Lake, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Division of Ser. No. 766,642, Feb. 8, 1977, Pat. No. 4,116,872. This application Feb. 27, 1978, Ser. No. 881,215

Int. Cl.[2] C10M *1/26, 3/20, 7/24;* **B32B** *15/04*

U.S. Cl. 428—467 **10 Claims**

1. A metal workpiece having on the surface thereof a film of a lubricating composition which provides lubricity thereto and which melts within the range of about 30°–100° C., said composition comprising at least one substantially neutral ester defined as follows:

I. The alcohol moieties are derived from (A) a polyalkylene glycol containing about 20–50 polyoxyalkylene units, or a mixture thereof with (B) at least one saturated aliphatic alcohol having at least about 10 carbon atoms;

II. The acid moieties are derived from (C) at least one C_{12-25} aliphatic monocarboxylic acid, or a mixture thereof with (D) at least one C_{4-20} aliphatic polycarboxylic acid.

4,191,802

COATING OF FIBROUS MATERIALS WITH COMPOSITIONS CONTAINING MIXTURES OF POLYCARBAMOYL SULPHONATES AND OTHER POLYMERS

Geoffrey B. Guise, and Maxwell A. White, both of Victoria, Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Continuation-in-part of Ser. No. 461,134, Apr. 15, 1974, abandoned. This application Jan. 6, 1978, Ser. No. 867,491

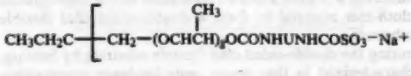
Claims priority, application Australia, Apr. 16, 1973, PB3014; Aug. 15, 1973, PB4494

Int. Cl.[2] B05D *3/02;* **B32B** *17/02, 19/00;* **B37B** *9/02*

U.S. Cl. 428—375 **5 Claims**

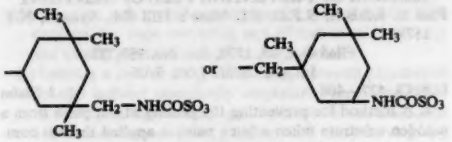
1. A method for the treatment of a fibrous material, which method comprises treating the material with a composition comprising (A) at least one compound selected from the group consisting of:

(1) products of the structure



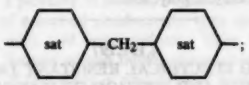
wherein U=$(CH_2)_6$, g is from 1 to 40;

(2) products of the structure stated in (1) wherein—UNH-$COSO_3$ is:



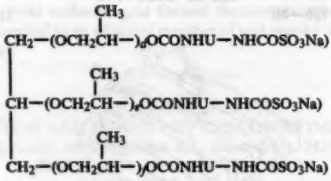
g is from 1 to 40;

(3) products of the structure stated in (1) wherein U is



g is from 1 to 40;

(4) products of the structure



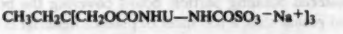
wherein U is—$(CH_2)_6$— and d, e, and f are from 14–18;

(5) products of the structure stated in (4) wherein d, e and f are 1, and U is—$(CH_2)_6$—;

(6) products of the structure stated in (4) wherein U is as stated in (2) and d, e, and f are from 14–18;

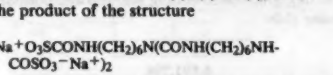
(7) products of the structure stated in (4) wherein U is as stated in (3) and d, e and f are from 14–18;

(8) products of the structure



wherein U is as stated in (1), (2) or (3); and,

(9) the product of the structure



and (B) at least one non-halogenated polymer selected from the group consisting of

(a) acrylic polymers or copolymers;

(b) latices of polymers or copolymers of styrene; butadiene or acrylonitrile;

(c) latices of polymers or copolymers of vinyl acetate;

(d) polyurethane latices;

(e) blocked isocyanates; and,

(f) epoxy resins

and heating the treated material to remove any volatile substances present and to assist in curing of the composition.

4,191,803

EXPANDABLE PARTICLES OF A STYRENE POLYMER HAVING SMALL PARTICLE SIZE

Tetsuya Katoh, Ichihara, Japan, assignor to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Nov. 17, 1978, Ser. No. 961,886

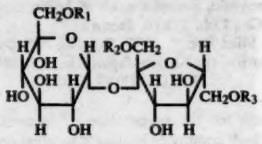
Claims priority, application Japan, Nov. 17, 1977, 52-138094

Int. Cl.[2] C08J *9/22*

U.S. Cl. 428—407 **4 Claims**

1. Expandable particles of a styrene polymer containing therein 3 to 8% by weight of a blowing agent and having a

particle size of 0.8 to 0.25 mm., in diameter, or their pre-expanded particles, which comprises an ester of sucrose represented by the formula:



wherein R_1, R_2 and R_3 each represent a hydrogen atom, an alkanoyl group having 6 to 22 carbon atoms or an alkenoyl group having 6 to 22 carbon atoms; and all of R_1, R_2 and R_3 are not hydrogen atoms at the same time, or its derivative, said ester of sucrose or its derivative being coated on the surface of said particles.

4,191,804

COATING COMPOSITION

Hermann P. Weber, Tarzana, Calif., assignor to Techsight Corp., Chatsworth, Calif.

Filed Jun. 30, 1978, Ser. No. 920,669
Int. Cl.² G02B 1/10; B32B 27/42; C08J 7/04; C08L 61/28
U.S. Cl. 428—409 **16 Claims**

1. In a coating composition which comprises:

a pigment-free aqueous composition comprising a dispersion of colloidal silica in a lower aliphatic alcohol-water solution of the partial condensate of a silanol of the formula $RSi(OH)_3$ in which R is selected from the group consisting of alkyl radicals of 1 to 3 inclusive carbons, the vinyl radical, the cyanoethyl radical, the 3,3,3-trifluoropropyl radical, the gamma-glycidoxypropyl radical, at least 70 weight percent of the silanol being $CH_3Si(OH)_3$, said composition containing 10 to 50 weight percent solids consisting essentially of 10 to 70 weight percent colloidal silica and 30 to 90 weight percent of the partial condensate, said composition containing sufficient acid to provide a pH in the range of about 3.0 to about 6.0;

the improvement which comprises:

from about 3.5 percent to about 20 percent by weight based on the solids content of the silica-silanol dispersion of a pigment-free resin selected from the group consisting of amino resins and amino resins which have been at least partially alkylated with at least one aliphatic alcohol having from 1–8 carbons, and mixtures thereof, said resin being dispersible in said silica-silanol dispersion.

16. A polycarbonate surface having thereon a cured continuous coating of the coating composition as claimed in claim 1.

4,191,805

METHOD OF FORMING A LAYER OF MATERIAL FROM A SOLUTION

Hans-Henning Nolte, Gelsenkirchen, Fed. Rep. of Germany, assignor to BFG Glassgroup, Paris, France

Filed Sep. 12, 1977, Ser. No. 832,614
Claims priority, application United Kingdom, Sep. 24, 1976, 39782/76
Int. Cl.² B32B 9/04, 31/00
U.S. Cl. 428—539 **22 Claims**

1. A method of forming a very uniform layer of intumescent material from a solution containing the intumescent material and a solvent which comprises the steps of forming the solution into a layer in a mold, contacting at least one major face of the solution layer with a wall of the mold comprising a semi-permeable film which is permeable over the area of that face substantially to the vapor phase only of said solvent, and effecting the escape of solvent simultaneously from both major faces of said layer including from at least one said major face by vapor diffusion through said wall so as to set the layer.

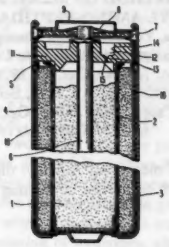
20. A method of manufacturing a fire-screening glazing panel comprising at least one layer of intumescent material held between two plies, of which at least one supports said layer, said method comprising forming said layer by the method as defined in claim 1 and assembling said layer between said two plies.

4,191,806

PRESSURE VENT FOR A SEALED PRIMARY CELL

Isaac I. Levy, Cambridge, Wis., assignor to ESB Incorporated, Philadelphia, Pa.

Filed Aug. 28, 1978, Ser. No. 937,505
Int. Cl.² H01M 2/12
U.S. Cl. 429—56 **8 Claims**



1. A sealed primary cell comprising

a generally tubular envelope having a mouth at one end thereof;

a mass of electrolyte disposed in the envelope;

a disc having an inner and outer surface and extending across the mouth of the envelope to seal the interior of the envelope;

an outer cap assembly disposed over the disc; and

a terminal means extending through the disc and into the electrolyte;

wherein the disc is formed of polysulfone, polyphenylene oxide, polyamides, polypropylene, polyethylene, polystyrene or acrylonitrile-butadiene-styrene and has a recess, the recess defined by a wall and a diaphragm; said diaphragm having at least two radial grooves.

4,191,807

AIRCRAFT BATTERY

David L. Karpal, Redlands, Calif., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Jul. 31, 1978, Ser. No. 929,345
Int. Cl.² H01M 2/02
U.S. Cl. 429—176 **6 Claims**

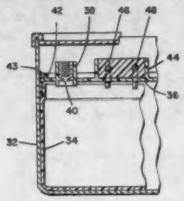
1. In an aircraft battery, the combination comprising:

a generally box-like aluminum housing;

a battery casing of polypropylene material configured for fitting within said housing in close fitting relation therein with the top of said casing being recessed below the open end of said housing; and

means for bonding said casing within said housing said casing includes a cover portion having a substantially periph-

eral ridge in close spaced relation with the interior of said housing and said means for bonding includes a silicon



composition sealant in the space between said ridge and said housing.

4,191,808

METHOD OF MEASURING DIPEPTIDYL-AMINO-PEPTIDASE ACTIVITY

Toshiharu Nagatsu, Yokohama, and Shumpei Sakakibara, Suita, both of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Division of Ser. No. 733,343, Oct. 18, 1976, Pat. No. 4,119,620. This application Apr. 17, 1978, Ser. No. 897,043

Claims priority, application Japan, Oct. 30, 1975, 50-130809

Int. Cl.[2] G01N *31/14*

U.S. Cl. 435—24 **20 Claims**

1. A method of measuring X-prolyl dipeptidyl-aminopeptidase activity which comprises contacting a compound having the structure:

X-L-proline-Y

or an acid salt thereof with said X-prolyl dipeptidyl-aminopeptidase in an aqueous medium at pH 7 to 9 under conditions suitable for the enzymatic reaction to occur and assaying the enzymatically liberated Y-H, said X being a residue of an amino acid selected from the group consisting of glycine, alanine, valine, leucine, serine, threonine, phenylalanine, tyrosine, tryptophane, glutamic acid, aspartic acid, lysine and arginine; and said Y being a residue of said Y-H selected from the group consisting of p-nitroaniline, p-phenylazoaniline, and 4-phenylazo-1-naphthylanine.

4,191,809

METHOD OF MEASURING ENZYMATIC ACTIVITY USING NOVEL PEPTIDE DERIVATIVES

Toshiharu Nagatsu, Yokohama, and Shumpei Sakakibara, Suita, both of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Division of Ser. No. 878,826, Feb. 17, 1978, Pat. No. 4,147,692. This application Sep. 20, 1978, Ser. No. 943,778

Claims priority, application Japan, Feb. 26, 1977, 52-20663; Jun. 16, 1977, 52-71469

Int. Cl.[2] G01N *31/14*

U.S. Cl. 435—24 **4 Claims**

1. A method of measuring X-prolyl dipeptidyl-aminopeptidase activity which comprises contacting 7-glycyl-L-prolylamino-4-methylcoumarin or acid salts thereof with said X-prolyl dipeptidyl-aminopeptidase in an aqueous medium under conditions and for a period of time sufficient to effect enzymatic hydrolysis and assaying the enzymatically formed 7-amino-4-methylcoumarin.

4,191,810

PROCESS FOR THE PRODUCTION OF IMMOBILIZED GLUCOSE ISOMERASE

Nakajima Yoshikazu; Suzuki Kazumasa, both of Okayama, and Makino Tsuyoshi, Kamakura, all of Japan, assignors to Mitsui Sugar Co., Ltd., Tokyo, Japan

Filed Dec. 1, 1977, Ser. No. 856,604

Claims priority, application Japan, Dec. 3, 1976, 51/144639

Int. Cl.[2] C07G *7/02*

U.S. Cl. 435—177 **11 Claims**

1. A process for the preparation of immobilized glucose isomerase, which comprises heating microbial cells of Actinomycetes which have glucose isomerase activity, at a temperature of 70°–80° C. for 1–20 minutes in a culture medium adjusted to a pH value of 6–9, rapidly cooling the heated medium, collecting the microbial cells by filtration or centrifugation, treating the collected cells with freeze and thawing method, adding gelatin or sodium caseinate in an amount of 2–10% based on the weight of the cells in dry base, forming a paste by kneading the obtained mixture, impregnating the formed paste in acetone which contains 0.2–1.0% of glutaraldehyde to result in solidification, removing the solvent from the solidified microbial cells by filtration without washing and drying the filtered cells to produce immobilized glucose isomerase preparation.

4,191,811

ION EXCHANGE MEMBRANES BASED UPON POLYPHENYLENE SULFIDE AND FLUOROCARBON POLYMERIC BINDER

Russell B. Hodgdon, Sudbury, Mass., assignor to Ionics, Incorporated, Watertown, Mass.

Division of Ser. No. 773,371, Mar. 1, 1977, Pat. No. 4,110,265. This application Aug. 7, 1978, Ser. No. 931,640

Int. Cl.[2] B01D *13/04*; C08J *5/22*

U.S. Cl. 521—27 **8 Claims**

1. A method for producing a heterogeneous cation exchange membrane having increased resistance to oxidation comprising preparing a batter mixture of a sulfonated polyphenylene sulfide polyelectrolyte and a fluorocarbon polymeric film forming binder, said binder being dissolved in an appropriate solvent, forming a thin film from said batter mixture and allowing the said solvent to evaporate therefrom to form a solid substantially unfractured membrane.

4,191,812

ION EXCHANGE PROCESS INVOLVING EMULSION ION EXCHANGE RESINS

Berni P. Chong, North Wales, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

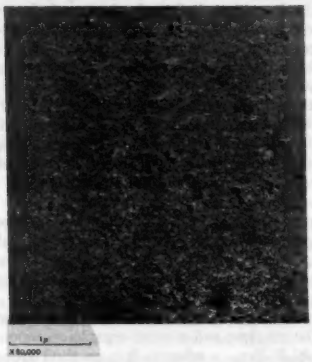
Filed Sep. 19, 1978, Ser. No. 943,891

Int. Cl.[2] C08J *3/00*; B01D *15/04*

U.S. Cl. 521—28 **13 Claims**

1. A process for changing the ionic form of a plurality of ion exchange resins of the same ion exchange type, at least one of the resins being in the physical form of approximately spherical, submicroscopic beads and initially being substantially in a first ionic form, and the balance of the resins being in the physical form of macrobeads and initially being in the second ionic form, which process comprises contacting the macrobeads in the second ionic form with an emulsion of the submi-

croscopic beads in the first ionic form until sufficient ion exchange occurs between the ions of the submicroscopic beads



and the ions of the macrobeads to substantially change the ionic form of at least one of the resins.

4,191,813

POLYMERIC ADSORBENTS FROM VINYLBENZYL CHLORIDE COPOLYMER BEADS

Samuel F. Reed, Holland, and Robert K. Pinschmidt, Jr., Allentown, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jul. 24, 1978, Ser. No. 927,226

Int. Cl.[2] B01J *1/22*; C08F *212/36, 212/10*; C08J *3/24*

U.S. Cl. 521—31 **26 Claims**

1. A polymeric adsorbent comprising lightly crosslinked copolymer beads of the macronet type, containing at least 40% by weight of vinylbenzyl chloride, the balance of monomers in said copolymer beads, if any, comprising a major proportion of aromatic monomers, said lightly crosslinked copolymer beads being post-crosslinked in a swollen state with a Lewis acid catalyst.

4,191,814

POLYAMINE-CROSSLINKED ANION EXCHANGE RESIN

David R. Amick, Chalfont, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Jul. 24, 1978, Ser. No. 927,196

Int. Cl.[2] C08F *8/32*; B01J *1/08*

U.S. Cl. 521—32 **12 Claims**

1. A crosslinked anion exchange resin produced by reacting stabilized poly(chloromethylstyrene) polymer beads with a polyamine containing at least 2 tertiary amine groups of which at least one is a terminal group.

4,191,815

HYDROPHILE POLYURETHANE FOAM, PROCESS FOR PREPARING SAID FOAM AND HYDROPHILE PRODUCT BASED ON SAID FOAM

Lucien Jourquin, Wetteren, and Eddie Du Prez, St-Maria-Oudenhove, both of Belgium, assignors to s.a. PRB, Brussels, Belgium

Filed Mar. 11, 1977, Ser. No. 776,681

Claims priority, application Luxembourg, Mar. 12, 1976, 74539

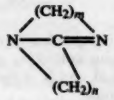
Int. Cl.[2] C08G *18/14, 18/20*; B32B *27/40*

U.S. Cl. 521—51 **2 Claims**

1. A process for preparing a hydrophile polyurethane foam absorption material for medical and hygienic use comprising reaction of hydrophile polyol, a polyisocyanate wherein NCO groups are not directly bonded to an aromatic ring, a foam stabilizer, a swelling agent and an effective amount of a catalyst, wherein the catalyst consists essentially of:

(A) at least one compound selected from the group consisting of

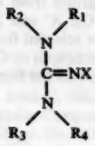
(1)diazabicycloalkenes of the formula:



(I)

wherein m varies from 3 to 7 and n from 2 to 4, and salts thereof with organic acids the dissociation constant of which is $Ka \leqq 10^{-2}$;

(2) substituted guanidines and salts thereof of the formula:

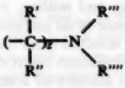


(II)

wherein R_1, R_2, R_3 and R_4 can independently represent a C_1–C_4 alkyl radical, a C_1–C_4 alkyl radical substituted by a C_1–C_4 alkoxy radical, or a heterocyclic C_5–C_7 radical comprising at most two atoms from the group consisting of sulfur and oxygen, R_1 and R_2 and/or R_3 and R_4 may form with the adjacent nitrogen a heterocyclic C_5–C_7 ring containing at most one member from the group consisting of sulfur or oxygen atom, X represents a member selected from the group consisting of hydrogen, phenyl, a phenyl group substituted by one or more C_1–C_4 alkoxy radicals, C_1–C_{12} alkyl radicals or halogens, or represents a radical of the formula:

(III)

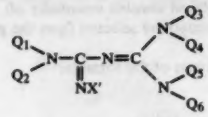
wherein R_5, R_6 and R_7 can independently represent hydrogen, a C_1–C_4 alkyl radical or a C_1–C_4 alkyl radical substituted by a member selected from the group consisting of phenyl, substituted phenyl, C_1–C_4 alkoxy, C_6–C_{15} aryloxy, nitrile or carbalkoxy, or R_7 may represent a member selected from the group consisting of a C_5–C_{18} alkyl radical, a substituted phenyl radical or a C_1–C_4 alkoxy radical; or one or two of the groups R_5–R_6, R_5–R_7 or R_6–R_7 can form a cyclic ring of more than one member selected from the group consisting of nitrogen, sulfur or oxygen atom, and X may also represent a radical of the formula:



(IV)

wherein z is an integer of from 2 to 12, R' and R'' represent a member selected from the group consisting of hydrogen or a C_1–C_4 alkyl radical, R''' and R'''' represent a member selected from the group consisting of a C_1–C_4 alkyl radical or form with the adjacent nitrogen of a C_5–C_6 cycloalkyl radical; and addition salts of said guanidines; and addition salts of guanidines;

(3) substituted biguanidines of the formula:

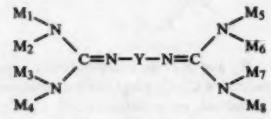

(V)

wherein Q_1 to Q_6 can independently represent a member selected from the group consisting of C_1–C_4 alkyl or a C_3–C_4 cycloalkyl radical, and X' is hydrogen or a carbamoyl radical of the formula:

(VI)

in which Z is a monovalent radical remaining after elimination of an isocyanate group from the above mentioned polyisocyanate, Q_1 to Q_6, X' and Z may optionally be substituted by a member selected from the group consisting of chlorine, bromine or a C_1 or C_2 alkoxy radical; and

(4) substituted biguanidines of the formula:


(VII)

wherein M_1 to M_8 can independently represent a C_1–C_4 alkyl radical, Y represents a group of the formula:

(VIII)

wherein M_9 and M_{10} represent a member selected from the group consisting of hydrogen or a C_1–C_4 alkyl radical, and α is an integer from 3 to 12 or represents a divalent cyclohexyl or a divalent isophorene radical; and

(B) at least one alkali or alkaline earth metal salt of an organic acid having a dissociation constant $Ka \leqq 10^{-1}$.

4,191,816
PROCESS FOR THE PREPARATION OF OLEFINE POLYMERIZATION CATALYSTS

Alfred Columberg, Geneva, Switzerland, assignor to Battelle Memorial Institute, Carouge-Geneva, Switzerland

Filed May 12, 1977, Ser. No. 796,234

Claims priority, application Switzerland, May 14, 1976, 6057/76

Int. Cl.² C08F *4/02, 10/02*

U.S. Cl. 526—124 **4 Claims**

1. A process for the polymerization of ethylene comprising the following steps:

(1) heating, while mixing and milling, for 10–30 hours at 70°–100° C. in the absence of air and moisture, at least one supporting compound selected from the group consisting of aluminum acetate, aluminum hydroxide and aluminum acetylacetonate with a mixture of acetic acid and acetic anhydride to obtain a solid product and then eliminating under heat and reduced pressure the volatile portions of the solid product;

(2) forming a homogeneous solution or dispersion of said solid product in a non-polar dry hydrocarbon solvent and adding thereto, while mixing, $TiCl_4$ for activation and heating the mixture to obtain a homogeneous solution or dispersion of an activated catalyst;

(3) polymerizing ethylene by admixing the activated catalyst, the ethylene and a metal-organic compound of formula $Al_nR_yX_{(3n-y)}$ wherein R is an alkyl group, X is a halogen, N is 1 or 2, y is an integer not exceeding 3 when n=1 and equal to 1, 3 or 5 when n=2, in a non-polar hydrocarbon at 20°–70° C. under a pressure of 2–50 atmospheres.

3. A process for the polymerization of ethylene comprising the following steps:

(1) heating, while mixing and milling, for 10–30 hours at 70°–100° C. in the absence of air and moisture, magnesium acetate with a mixture of acetic acid and acetic anhydride to obtain a solid product and then eliminating under heat and reduced pressure the volatile portions of the solid product;

(2) forming a homogeneous solution or dispersion of said solid product in a non-polar dry hydrocarbon solvent and adding thereto, while mixing, $TiCl_4$ for activation and heating the mixture to obtain a homogeneous solution or dispersion of an activated catalyst;

(3) polymerizing ethylene by admixing the activated catalyst, the ethylene and a metal-organic compound of formula $Al_nR_yX_{(3n-y)}$ wherein R is an alkyl group, X is a halogen, n is 1 or 2, y is an integer not exceeding 3 when n=1 and equal to 1, 3 or 5 when n=2, in a non-polar hydrocarbon at 20°–70° C. under a pressure of 2–50 atmospheres.

4,191,817
CURABLE COMPOSITIONS AND ELASTOMERS PREPARED THEREFROM

August Schiller, Marktl,Bergham; Eckhart Louis; Erhard Bosch, both of Burghausen, and Karl Braunsperger, Raitenhaslach, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 19, 1978, Ser. No. 925,909

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1977, 2737303

Int. Cl.² C08G *77/26*

U.S. Cl. 528—38 **7 Claims**

1. A curable composition which is stable under anhydrous conditions, but when exposed to moisture, cures to an elastomer consisting essentially of (1) a diorganopolysiloxane having terminal condensable groups, (2) a silicon compound having at least 3 hydrolyzable groups per molecule, said hydrolyzable groups are selected from the group consisting of amino groups which are bonded to silicon via nitrogen, oxime groups which are bonded to silicon via oxygen and mixtures thereof and (3) at least one organosilicon compound having at least one amino group which is bonded to silicon via carbon and at least one siloxane-oxygen atom.

4,191,818
PROCESS FOR PREPARING HEAT-RESISTANT POLYURETHANE ELASTOMERS HAVING NO SECONDARY SOFTENING RANGE

Karl H. Illers, Otterstadt, and Herbert Stutz, Karlsruhe, both of Fed. Rep. of Germany, assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation of Ser. No. 730,807, Oct. 8, 1976, abandoned. This application Jul. 10, 1978, Ser. No. 923,114

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1975, 2547864

Int. Cl.² C08G *18/10*

U.S. Cl. 528—44 **4 Claims**

1. A process for the production of a castable heat-resistant polyurethane elastomer from primarily linear and substantially difunctional high-molecular-weight polyhydroxyl compound, polyisocyanate, and chain extender, characterized in that the high-molecular-weight polyhydroxyl compound is first reacted with such a quantity of polyisocyanate that the ratio of OH:NCO groups amounts to 1:0.66 to 1:0.85 to obtain an adduct of polyhydroxyl compound and an organic diisocya-

nate, which adduct is substantially anhydrous, and contains terminal hydroxyl groups, the adduct with terminal hydroxyl groups is then reacted with a diol as a chain extender and an excess of a symmetrical aromatic diisocyanate and with the provisos that the ratio of the number of isocyanate groups to the total number of all hydrogen atoms capable of reacting with the isocyanate groups amounts to approximately 1.0 to 1.2:1, and said chain extender forms a crystalline or crystallizable urethane with said aromatic diisocyanate, thereby obtaining a castable material exhibiting a start of softening at an advanced temperature of about 180° C. or greater.

4,191,819
ACTIVATED ANIONIC POLYMERIZATION OF LACTAM WITH PARTIALLY MASKED POLYISOCYANATE

Rolf-Volker Meyer; Rolf Dhein; Kurt Schneider, and Friedrich Fahnler, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 12, 1977, Ser. No. 823,979

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1976, 2637010

Int. Cl.² C08G *69/18*

U.S. Cl. 528—315 **5 Claims**

1. In a process for the preparation of a moldable polyamide by polymerizing a lactam having at least 5 ring members in the presence of a catalyst and an activator, the improvement wherein the activator is at least one fluid, partially masked polyisocyanate selected from the group consisting of aliphatic polyisocyanate, araliphatic polyisocyanate and cycloaliphatic polyisocyanate, said polyisocyanate being masked with 0.5–0.7 equivalents of lactam per equivalent of NCO.

4,191,820
PROCESS FOR PREPARING POLYALKYLENE POLYAMINE POLYETHERS

William K. Langdon, Grosse Ile, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jan. 3, 1978, Ser. No. 866,206

Int. Cl.² C08G *73/02, 65/26*

U.S. Cl. 528—405 **7 Claims**

1. A method for preparing a water-soluble amine-derived polyether, comprising:

reacting ethylenediamine with a halogen-containing polymer of an epihalohydrin in the presence of an organic solvent at a temperature ranging from about 120° C. to about 200° C., and

wherein the ratio of moles of ethylenediamine per available halogen atom is less than 3:1.

4,191,821
PROCESS FOR PURIFYING RECIRCULATING GASES OF CONDENSED POLYMER PARTICLES

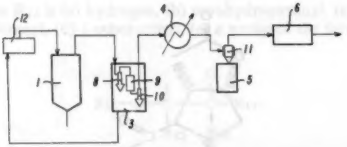
Pierre Gloriod, Lillebonne, France, assignor to Societe Chimique des Charbonnages - CdF Chimie, France

Filed Jul. 11, 1978, Ser. No. 923,656

Claims priority, application France, Jul. 13, 1977, 77 21758

Int. Cl.² C08F *220/42*

U.S. Cl. 528—501 **8 Claims**



1. A process for eliminating low molecular-weight polymers from recirculting gases of facilities carrying out polymerization or copolymerization of ethylene at a pressure of 300 to 2500 bars and a temperature of 130° C. to 350° C., in which facilities a mixture of monomer and polymer leaving the reactor is expanded into a separator operating under a pressure of 50 to 500 bars, said gases being the gaseous phase leaving said separator, comprising

(a) passing said gases, at a temperature at least 20° C. higher than the melting point of the low polymers, through at least one standard cyclone at an inlet velocity between 1 and 10 m/s to eliminate some of said low polymers;

(b) then cooling said gases from said cyclone to a temperature lower than the melting point of the low polymers; and

(c) then passing said cooled gases through at least one heated cyclone at an inlet velocity between 2 and 20 m/s to eliminate more of said low polymers.

4,191,822
5-HYDROXY-PGI$_1$ COMPOUNDS

Roy A. Johnson, and John C. Sih, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

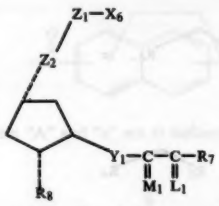
Continuation-in-part of Ser. No. 815,648, Jul. 14, 1977, Pat. No. 4,110,532. This application Jun. 28, 1978, Ser. No. 919,894

The portion of the term of this patent subsequent to Aug. 29, 1995, has been disclaimed.

Int. Cl.² C07D *307/93*

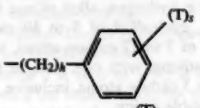
U.S. Cl. 542—416 **1 Claim**

1. A prostacyclin analog of the formula

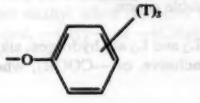


wherein R_7 is

(1) $-(CH_2)_m-CH_3$,



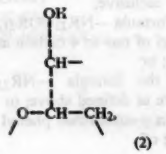
(2)



(3)

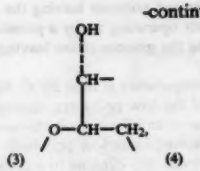
wherein m is the integer one, 2, 4, or 5; h is the integer 2 or 3; s is the integer zero, one, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or with the proviso that not more than two T's are other than alkyl;

wherein Z_2 is



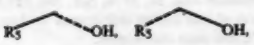
(1) (2)

-continued



(3) (4)

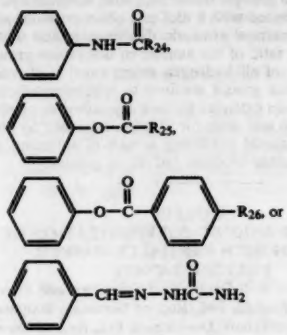
wherein Z_1 is
(1) $-(CH_2)_g-CH_2-CH_2-$,
(2) $-(CH_2)_g-CH_2-CF_2-$, or
(3) trans$-(CH_2)_g-CH=CH-$,
wherein R_8 is hydrogen, hydroxy, or hydroxymethyl;
wherein Y_1 is
(1) trans$-CH=CH-$,
(2) cis$-CH=CH-$,
(3) $-CH_2CH_2-$,
(4) trans$-CH=C(Hal)-$, or
(5) $-C\equiv C-$
wherein Hal is chloro or bromo;
wherein M_1 is



wherein R_5 is hydrogen or alkyl with one to 4 carbon atoms, inclusive;
wherein L_1 is

a mixture of

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein X_6 is
(1) $-COOR_1$; wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation,
(2) $-CH_2OH$,
(3) $-CH_2NL_2L_3$, wherein L_2 and L_3 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or $-COOR_1$, wherein R_1 is as defined above;
(4) $-COL_4$, wherein L_4 is
(a) amino of the formula $-NR_{21}R_{22}$, wherein R_{21} and R_{22} are hydrogen, alkyl of one to 12 carbon atoms, inclusive; aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 3 carbon atoms, inclusive, or phenyl substituted with hydroxycarbonyl or alkoxycarbonyl of one to 4 carbon atoms, inclusive;
(b) carbonylamino of the formula $-NR_{23}COR_{21}$, wherein R_{23} is hydrogen or alkyl of one to 4 carbon atoms and R_{21} is as defined above; or
(c) sulphonylamino of the formula $-NR_{23}SO_2R_{21}$, wherein R_{21} and R_{23} are as defined above; or
(5) $-COOL_5$, wherein L_5 is p-substituted phenyl selected from the group consisting of



wherein R_{24} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or $-NH_2$; R_{25} is methyl, phenyl, $-NH_2$, or methoxy; and R_{26} is hydrogen or acetamido, and the 1,5- and 1,15-lactones thereof.

4,191,823

PROCESS FOR THE PREPARATION OF OXAPROSTAGLANDIN INTERMEDIATES

Werner Skuballa; Bernd Raduchel, and Helmut Vorbrueggen, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

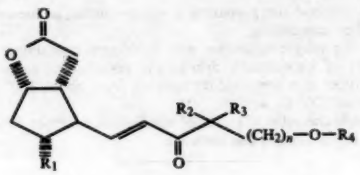
Filed Dec. 1, 1977, Ser. No. 856,544

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1976, 2655004

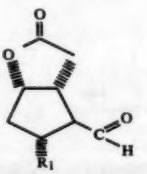
Int. Cl.[2] **C07D** *307/83*

U.S. Cl. 542—426 **10 Claims**

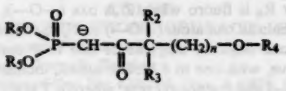
1. In a process for the preparation of an oxaprostaglandin intermediate of the formula



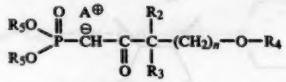
wherein
R_1 is hydrogen, alkyl, or a free or functionally modified hydroxy group;
R_2 and R_3, are the same or different and each is hydrogen, halogen or alkyl;
R_4 is alkyl or optionally substituted aryl; and
n is 0, 1, 2 or 3;
which comprises reacting an aldehyde of the formula



wherein R_1 is as defined above with an anion of the formula



wherein
n, R_2, R_3 and R_4 are as defined above; and
R_5 is alkyl;
the improvement wherein the anion is added to the reaction medium in a form which consists essentially of its crystalline alkali metal salt of the formula



wherein A is an alkali metal atom.

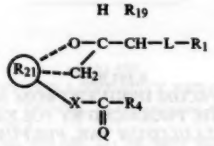
4,191,824

5-HALO PGI COMPOUNDS

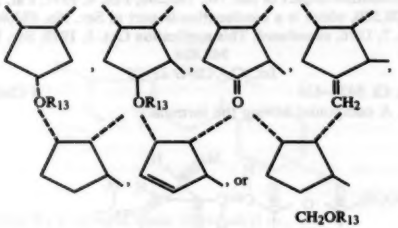
Udo F. Axen, Plainwell, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 819,857, Jul. 28, 1977, Pat. No. 4,158,667, which is a continuation-in-part of Ser. No. 725,548, Sep. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 716,972, Aug. 23, 1976, abandoned, which is a continuation-in-part of Ser. No. 655,110, Feb. 4, 1976, abandoned. This application Nov. 9, 1978, Ser. No. 959,399
Int. Cl.[2] C07D *307/93*
U.S. Cl. 542—429 **35 Claims**

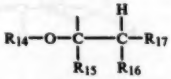
1. A compound of the formula



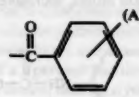
or a mixture comprising that compound and the enantiomer thereof wherein (R_{21}) is



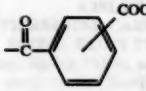
wherein R_{13} is (a) hydrogen, (b) tetrahydropyranyl, (c) tetrahydrofuranyl, (d) 1-ethoxyethyl, (e) a group of the formula



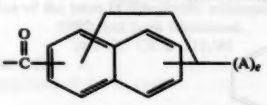
wherein R_{14} is alkyl of one to 18 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 alkyl of one to 4 carbon atoms, inclusive, wherein R_{15} and R_{16} are the same or different, being hydrogen, alkyl of one to 4 carbon atoms, inclusive, phenyl or phenyl substituted with one, 2, or 3 alkyl of one to 4 carbon atoms, inclusive, or, when R_{15} and R_{16} are taken together, —(CH_2)a— or —$(CH_2$.)b—O—(CH_2)c— wherein a is 3, 4, or 5, b is one, 2, or 3, and c is one, 2, or 3, with the proviso that b plus c is 2, 3, or 4, and wherein R_{17} is hydrogen or phenyl, or (f) carboxyacyl including


(a')

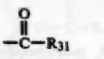
wherein "A" is alkyl of one to 4 carbon atoms, inclusive, bromo, phenylalkyl of 7 to 10 carbon atoms, inclusive, or nitro, and "e" is zero to 5, inclusive, provided that not more than two A's are other then alkyl, and that the total number of carbon atoms in the A's does not exceed 10 carbon atoms,


(b')

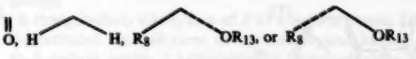
wherein R_{30} is alkyl of one to 4 carbon atoms, inclusive,


(c')

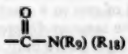
wherein "A" and "e" are as defined above, or


(d')

wherein R_{31} is alkyl of one to 7 carbon atoms, inclusive,
wherein L is
(1) —(CH_2)d—$C(R_2)_2$—
(2) —CH_2—O—CH_2—Y— or
(3) —CH_2CH=CH—
wherein d is zero to 5, R_2 is hydrogen, methyl, or fluoro, being the same or different with the proviso that one R_2 is not methyl when the other is fluoro, and Y is a valence bond, —CH_2—, or —$(CH_2)_2$—,
wherein Q is

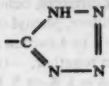


wherein R_8 is hydrogen or alkyl of one to 4 carbon atoms, inclusive, and R_{13} is as defined above,
wherein R_1 is
(1) —$COOR_3$
(2) —CH_2OH
(3) —$CH_2N(R_{19})(R_{18})$


(4)

or

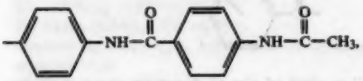
-continued



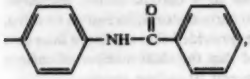
(5)

wherein R_3 is (a) hydrogen, (b) alkyl of one to 12 carbon atoms, inclusive, (c) cycloalkyl of 3 to 10 carbon atoms, inclusive, (d) aralkyl of 7 to 12 carbon atoms, inclusive, (e) phenyl, (f) phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive,

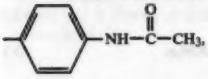
(g)



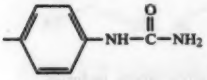
(h)



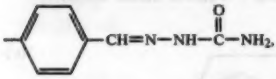
(i)



(j)

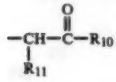


(k)



(l)

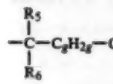
(m)



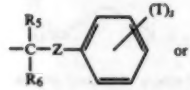
wherein R_{10} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, and wherein R_{11} is hydrogen or benzoyl, or (n) a pharmacologically acceptable cation, wherein R_8 is hydrogen, methyl, or ethyl, and wherein R_{18} is hydrogen, alkyl of one to 4 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with alkyl of one to 4 carbon atoms, inclusive;

wherein R_4 is

(1)

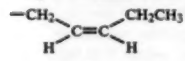


(2)



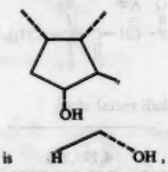
or

(3)



wherein C_gH_{2g} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between $-CR_5R_6-$ and terminal methyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro and the further proviso that neither R_5 nor R_6 is fluoro when Z is oxa (—O—); wherein Z represents an oxa atom (—O—) or CjH_{2j} wherein CjH_2 is a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive between CR_5R_6- and the phenyl ring; wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $-OR_7-$ wherein R_7 is alkyl of one to 4 carbon atoms, inclusive, and s is zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl and when s is 2 or 3 the T's are either the same or different;

wherein R_{19} is chloro, bromo, or iodo with the proviso that R_{19} is not bromo when R_{20} is



L is $-(CH_2)_3-$, R_4 is n-pentyl, and X is $-C\equiv C-$; and wherein X is

(1) trans—CH=CH—
(2) cis—CH=CH—
(3) —C≡C— or
(4) $-CH_2CH_2-$.

4,191,825

DIACYLOXYACIDS DERIVED FROM ACID S, AN ANTIBIOTIC PRODUCED BY *POLYANGIUM CELLULOSUM* VAR. *FULVUM*

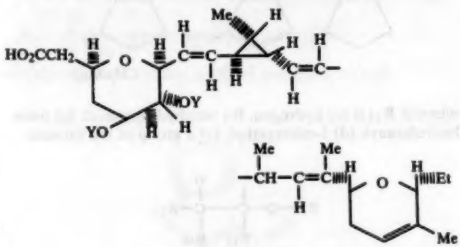
David T. Connor, Ann Arbor, Mich.; Samuel M. Ringel, Rockaway; Sidney Roemer, Flanders, both of N.J., and Maximillian von Strandtmann, New Castle, Del., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 765,568, Feb. 4, 1977, Pat. No. 4,138,550, which is a continuation-in-part of Ser. No. 693,400, Jun. 7, 1976, abandoned. This application Oct. 5, 1978, Ser. No. 948,854

Int. Cl.² C09B *23/00*

U.S. Cl. 542—430 **5 Claims**

1. A compound having the formula I:



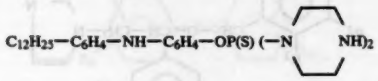
wherein Y is an acyl group derived from formic acid or derived from a lower alkyl carboxylic acid having from 3 to 7 carbon atoms.

4,191,826
BISPIPERAZIDO PHOSPHORUS ACID ESTERS

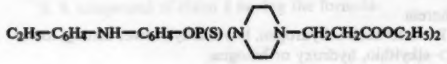
Johny C. Hermans, Wespelaar, Belgium, assignor to s.a. Texaco Belgium n.v., Brussels, Belgium

Continuation of Ser. No. 628,288, Nov. 3, 1975, Pat. No. 4,081,445. This application Mar. 27, 1978, Ser. No. 890,334
Claims priority, application United Kingdom, May 21, 1975, 21796/75
Int. Cl.² C07F 9/65
U.S. Cl. 544—337 3 Claims

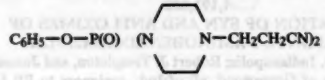
1.



2.



3.

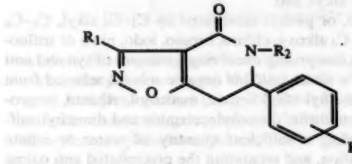


4,191,827
SUBSTITUTED 4-HYDROXY PYRIDONES

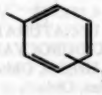
Jeffrey Nadelson, Denville, N.J., assignor to Sandoz, Inc., East Hanover, N.J.

Division of Ser. No. 819,006, Jul. 26, 1977, Pat. No. 4,131,679. This application Sep. 18, 1978, Ser. No. 943,444
Int. Cl.² C07D 498/04
U.S. Cl. 546—116 1 Claim

1. A compound of the formula



wherein R_1 is straight chain lower alkyl or



where

R_4 is hydrogen or halo having an atomic weight of about 19 to 36, and

R_2 is straight chain lower alkyl, and

R_3 is hydrogen or halo as defined above,

or a pharmaceutically acceptable salt thereof.

4,191,828
PROCESS FOR PREPARING 2-(2,2-DICYCLOHEXYLETHYL)PIPERIDINE

Stephen W. Horgan; Frank P. Palopoli, both of Montgomery, Ohio, and David L. Wenstrup, Edgewood, Ky., assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed Apr. 14, 1976, Ser. No. 677,036
Int. Cl.² C07D 24/02
U.S. Cl. 546—185 1 Claim

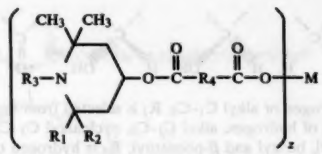
1. A process for the preparation of 2-(2,2-dicyclohexylethyl)piperidine which comprises reducing a glacial acetic acid solution of 2-(2,2-diphenylethenyl)pyridine with hydrogen at a pressure of 40 atmospheres and a temperature of about 115° C. in the presence of a 5 percent rhodium-on-carbon catalyst until hydrogen uptake ceases, said catalyst being present in a ratio of 0.5 parts of rhodium to 100 parts of said 2-(2,2-diphenylethenyl)pyridine, filtering said catalyst to obtain a clear filtrate, evaporating said filtrate to a residue, dissolving said residue in acetone, adding a solution of maleic acid dissolved in said solvent and recovering the precipitated 2-(2,2-dicyclohexylethyl)piperidine maleate therefrom.

4,191,829
HINDERED PIPERIDINE CARBOXYLIC ACIDS AND METAL SALTS THEREOF

Chester E. Ramey, Spring Valley, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 800,978, May 26, 1977, Pat. No. 4,139,520, which is a division of Ser. No. 592,006, Jun. 30, 1975, Pat. No. 4,031,095. This application Apr. 25, 1978, Ser. No. 899,958
The portion of the term of this patent subsequent to Nov. 18, 1992, has been disclaimed.
Int. Cl.² C07D 211/46
U.S. Cl. 546—222 17 Claims

1. A compound of the formula



wherein

R_1 and R_2 independently of each other are straight-or branched-chain alkyl having from 1 to 6 carbon atoms, or together with the carbon to which they are bound form a cyclopentyl or cyclohexyl ring, which is unsubstituted or substituted with a methyl group,

R_3 is hydrogen, alkyl having 1 to 12 carbon atoms, β-methoxyethyl, alkenyl having 3 to 4 carbon atoms propargyl, benzyl, or benzyl substituted with one or two methyl groups,

R_4 is straight-chain alkenylene of 2 to 4 carbon atoms, 1,2-disubstituted cycloalkylene or cycloalkenylene having 4 to 6 carbon atoms, 2,3-disubstituted bicycloalkylene or bicycloalkenylene having 7 to 8 carbon atoms or 1,2-, 1,3- or 1,4-disubstituted phenylene, or a straight-chain alkylene of 1 to 4 carbon atoms substituted by alkyl or alkenyl of 1 to 18 carbon atoms, provided that the straight-chain alkylene substituted by alkyl has more than 8 carbon atoms,

M is hydrogen or a metal selected from the group consisting of barium, calcium, magnesium, sodium, potassium, and

z has a value of from 1 to 4, the value of z being the same as the available valence of M.

2. A compound according to claim 1 wherein R_1 and R_2 are each methyl.

14. A compound according to claim 2 which is O-mono-(2,2,6,6-tetramethylpiperidin-4-ol)phthalate.

4,191,830

SUBSTITUTED TETRAHYDROBENZOTHIOPHENES

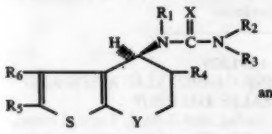
Goro Asato, Titusville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 912,813, Jun. 5, 1978, Pat. No. 4,156,670, which is a continuation of Ser. No. 699,431, Mar. 23, 1976, abandoned, which is a continuation-in-part of Ser. No. 532,449, Dec. 13, 1974, abandoned, which is a continuation-in-part of Ser. No. 436,827, Jan. 25, 1974, abandoned. This application Mar. 8, 1979, Ser. No. 18,694

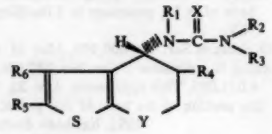
Int. Cl.[2] C07D *409/12*

U.S. Cl. 546—274 8 Claims

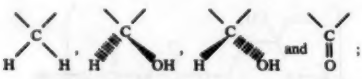
1. A compound selected from the group consisting of those of the formulae:



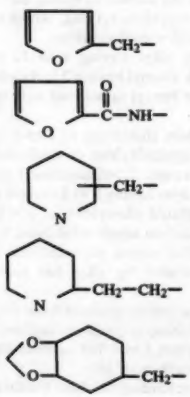
and



wherein X is oxygen or sulfur; Y is a divalent radical selected from the group consisting of those of the formulae:



R_1 is hydrogen or alkyl C_1–C_4; R_3 is selected from the group consisting of hydrogen, alkyl C_1–C_4, cycloalkyl C_3–C_6, allyl, 2-propynyl, benzyl and β-phenethyl; R_4 is hydrogen or alkyl C_1–C_4; R_5 is hydrogen, chloro, bromo or iodo; R_6 is hydrogen or alkyl C_1–C_4; R_2 is selected from the group consisting of the substituents listed in the following table:



4,191,831

IMIDAZOLYLETHOXY DERIVATIVES OF PYRIDIN-5-METHANOLS

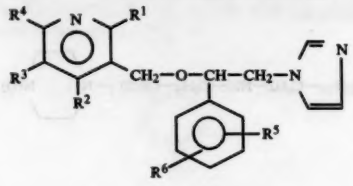
Hans Hoehn, Tegernheim, Fed. Rep. of Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Oct. 25, 1978, Ser. No. 954,730

Int. Cl.[2] C07D *401/12*

U.S. Cl. 546—278 10 Claims

1. A compound of the formula



wherein

R^1 to R^6 each is hydrogen, lower alkyl, lower alkoxy, lower alkylthio, hydroxy or halogen;

and acid addition salts thereof.

4,191,832

SEPARATION OF SYN AND ANTI OXIMES OF 1-SULFONYL-2-AMINOBENZIMIDAZOLES

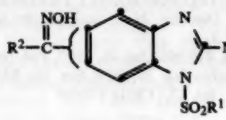
Kenneth S. Su, Indianapolis; Robert J. Templeton, and James H. Wikel, both of Greenwood, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 12, 1979, Ser. No. 19,526

Int. Cl.[2] C07D *235/30*

U.S. Cl. 548—306 6 Claims

1. A process for separating syn and anti oximes of the formula



wherein:

R^1 is C_1–C_5 alkyl; and

R^2 is phenyl, or phenyl substituted by C_1–C_4 alkyl, C_1–C_4 alkyl, C_1–C_4 alkoxy, chloro, bromo, iodo, nitro or trifluoromethyl, comprising dissolving a mixture of syn and anti oximes in a water mixcible organic solvent selected from acetone, methyl ethyl ketone, methanol, ethanol, isopropanol, acetonitrile, dimethylacetamide and dimethyl sulfoxide, adding a sufficient quantity of water to initate crystallization, and separating the precipitated anti oxime isomer.

4,191,833

ETHYLENICALLY UNSATURATED BLOCKED AROMATIC DIISOCYANATES

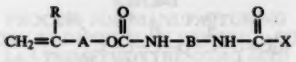
Harold A. Tucker, Shaker Heights, Ohio, assignor to The B.F. Goodrich Company, Akron, Ohio

Division of Ser. No. 734,945, Oct. 22, 1976, Pat. No. 4,113,958, which is a division of Ser. No. 550,627, Feb. 18, 1975, Pat. No. 4,008,247, which is a division of Ser. No. 412,325, Nov. 2, 1973, abandoned. This application Jun. 19, 1978, Ser. No. 916,648

Int. Cl.[2] C07D *231/10*

U.S. Cl. 548—378 3 Claims

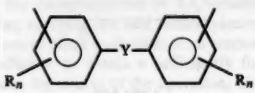
1. A compound of the formula



wherein R is hydrogen or a methyl or ethyl group;

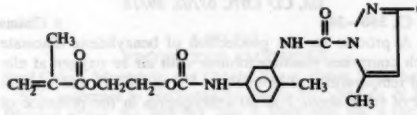
A is a carbonyloxyalkylene group having

2 to about 8 carbon atoms or an aralkylene group having 7 to about 12 carbon atoms; B is a bivalent aromatic group selected from the group consisting of arylene, naphthalene, and a group having the formula



where R is defined as above; Y is O, S, or $(CH_2)_n$; n=0 to 3; and X is the group remaining after a hydrogen atom is removed from the nitrogen atom of pyrazole.

3. A compound of claim 1 having the formula:



4,191,834

ETHYLENICALLY UNSATURATED BLOCKED AROMATIC DIISOCYANATES

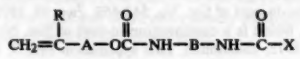
Harold A. Tucker, Shaker Heights, Ohio, assignor to The B.F. Goodrich Company, Akron, Ohio

Division of Ser. No. 734,945, Oct. 22, 1976, Pat. No. 4,113,958, which is a division of Ser. No. 550,627, Feb. 18, 1975, Pat. No. 4,008,247, which is a division of Ser. No. 412,325, Nov. 2, 1973, abandoned. This application Jun. 19, 1978, Ser. No. 916,646

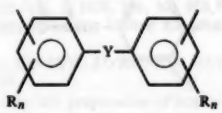
Int. Cl.[2] C07D *487/00*

U.S. Cl. 548—305 **2 Claims**

1. A compound of the formula



wherein R is hydrogen or a methyl or ethyl group; A is a carbonyloxyalkylene group having 2 to about 8 carbon atoms or an aralkylene group having 7 to about 12 carbon atoms; B is a bivalent aromatic group selected from the group consisting of arylene, naphthalene, and a group having the formula



where R is defined as above; Y is O, S, or $-(CH_2)_n-$; n = 0 to 3; and X is the group remaining after a hydrogen atom is removed from the nitrogen atom of benzimidazole.

2. A compound of claim 1 wherein R is hydrogen or methyl group; B is phenylene, tolylene, naphthalene, or a group where Y is $-(CH_2)_n-$, and n = 0 to 1.

4,191,835

BIS-ANTHRANILATES OF UREA DERIVATIVES

Jürgen Habermeier, Pfeffingen, and Roland Moser, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

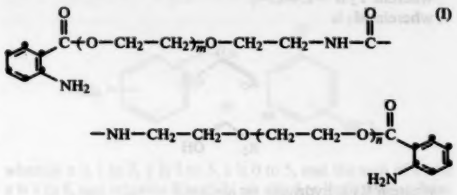
Filed Dec. 4, 1978, Ser. No. 966,425

Claims priority, application Switzerland, Apr. 27, 1978, 4587/78

Int. Cl.[2] C07C *101/54*; C08G *59/54*

U.S. Cl. 560—49 **3 Claims**

1. A bis-anthranilate of the formula I



(I)

or a mixture of such bis-anthranilates, in which, in the formula, m and n are each 0 or a number from 1 to 5 and the sum of m and n must be at least 1.

4,191,836

ANTHRANILATES OF POLYOXYETHYLATED CARBOXYLIC ACID

Jurgen Habermeier, Pfeffingen, and Roland Moser, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

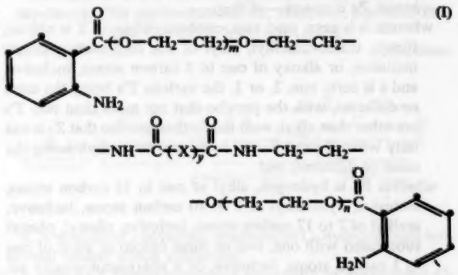
Filed Dec. 4, 1978, Ser. No. 966,420

Claims priority, application Switzerland, Apr. 27, 1978, 4586/78

Int. Cl.[2] C07C *101/54*; C08G *59/54*

U.S. Cl. 560—49 **7 Claims**

1. A bis-anthranilate of the formula I



(I)

or a mixture of such bis-anthranilates, wherein in the formula m and n are each 0 or a number from 1 to 5 and the sum of m and n must be at least 1, y is 0 or 1 and X is an alkylene having 1 to 8 C atoms, para- or meta-phenylene or para-cyclohexylene.

4,191,837

TRANS-2,3,13,14-TETRADEHYDRO-9-DEOXY-9-METHYLENE-ω-ARYL-PGF COMPOUNDS

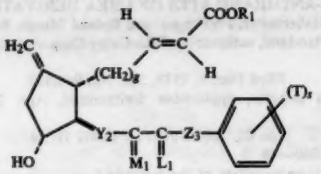
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 893,771, Apr. 5, 1978, Pat. No. 4,165,436. This application Aug. 11, 1978, Ser. No. 933,000

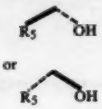
Int. Cl.[2] C07C *177/00*

U.S. Cl. 560—55 **14 Claims**

1. A prostaglandin analog of the formula



wherein Y_2 is —C≡C—;
wherein M_1 is



wherein R_5 is hydrogen or methyl;
wherein L_1 is

or a mixture of

and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein g is 4, 5, or 6,

wherein Z_3 is oxa or $—(CH_2)_h—$,

wherein h is zero, one, two, or three; wherein T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl, with the further proviso that Z_3 is oxa only when R_3 and R_4 are hydrogen or methyl, being the same or different; and

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,191,838

ACRYLOXY-ALKYLPROPANALS AND METHACRYLOXY-ALKYLPROPANALS

Franz Merger, Frankenthal; Friedrich Towae, and Erich Penzel, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

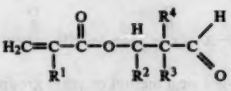
Filed May 1, 1978, Ser. No. 901,422

Claims priority, application Fed. Rep. of Germany, May 16, 1977, 2722097

Int. Cl.[2] C07C *69/54*

U.S. Cl. 560—205 **5 Claims**

1. An acryloxy-alkylpropanal or methacryloxy-alkylpropanal of the formula (1)



(I)

where R^1 is a substituent selected from —H and CH_3, R^2 is a substituent selected from —H and alkyl of 1 to 3 carbon atoms, R^3 is alkyl of 1 or 2 carbon atoms and R^4 is alkyl of 1 to 4 carbon atoms.

4,191,839

DIRECT OXIDATION OF TOLUENE TO BENZYLIDENE DIACETATE

James E. Lyons, Wallingford; Robert W. Shinn, Aston, and George Suld, Springfield, all of Pa., assignors to Suntech, Inc., Philadelphia, Pa.

Filed Mar. 27, 1978, Ser. No. 890,175

Int. Cl.[2] C07C *67/05, 69/16*

U.S. Cl. 560—241 **6 Claims**

1. A process for the production of benzylidene diacetate which comprises reacting toluene with air or oxygen at elevated temperatures of from about 75° to 200° C. and at pressures of from about 1 to 50 atmospheres in the presence of acetic anhydride and a strong acid catalyst consisting essentially of an alkyl or aryl sulfonic acid, an alkyl or aryl phosphonic acid, or phosphoric acid.

4,191,840

OXAMIC ACID DERIVATIVES

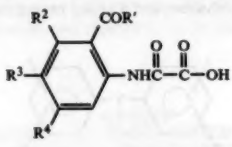
John H. Sellstedt, Pottstown; Charles J. Guinosso, King of Prussia, both of Pa., and Albert J. Begany, Tucson, Ariz., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 834,614, Sep. 19, 1977, Pat. No. 4,154,961, which is a continuation-in-part of Ser. No. 669,565, Mar. 23, 1976, Pat. No. 4,069,343, which is a continuation-in-part of Ser. No. 542,465, Jan. 20, 1975, Pat. No. 3,966,965, which is a continuation-in-part of Ser. No. 344,466, Mar. 23, 1973, abandoned. This application Feb. 7, 1979, Ser. No. 10,101

Int. Cl.[2] C07C *101/42*

U.S. Cl. 562—453 **7 Claims**

1. A compound of the formula:



wherein

R^1 is amino or lower(alkyl)amino;

R^2 in N-mono- or di-lower alkylamino(lower)alkoxy or mono- or di-lower alkylamino;

R^3 is hydrogen, lower alkyl, lower alkoxy, halo or nitro;

R^4 is hydrogen, lower alkyl or lower alkoxy;

or a pharmaceutically acceptable salt thereof.

4,191,841

PROCESS FOR MANUFACTURING 4-HYDROXY-3,5-DIMETHOXY BENZOIC ACID FROM 3,4,5-TRIMETHOXYBENZOIC ACID

Michel Soreau, Montmorency, and Yani Christidis, Paris, both of France, assignors to Societe Francaise Hoechst, Puteaux, France

Filed Mar. 23, 1979, Ser. No. 23,376
Claims priority, application France, Apr. 5, 1978, 78 10053
Int. Cl.[2] C07C *65/04*
U.S. Cl. 562—475 5 Claims

1. Process for manufacturing 4-hydroxy-3,5-dimethoxybenzoic acid by the demethlylation of 3,4,5-trimethoxybenzoic acid, comprising carrying out said demethylation in the presence of an excess of alkali hydroxide in an amount of ethylene glycol just sufficient to obtain a sufficiently fluid heterogeneous medium in the course of the operation, distilling off the ethylene glycol monomethyl ether and the water produced progressively with their formation, separating the resulting 4-hydroxy-3,5-dimethoxybenzoic acid by acidification by means of a strong acid and crystallizing the product.

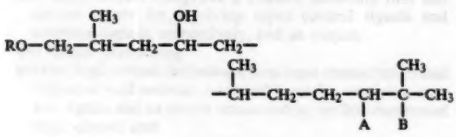
4,191,842

PROTECTED ALCOHOLS

Noal Cohen, Montclair, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 802,747, Jun. 2, 1977, Pat. No. 4,151,205, which is a division of Ser. No. 639,011, Dec. 9, 1975, Pat. No. 4,051,153, which is a continuation-in-part of Ser. No. 544,163, Jan. 27, 1975, Pat. No. 4,000,161. This application Jan. 17, 1979, Ser. No. 4,102
Int. Cl.[2] C07C *43/04*
U.S. Cl. 568—662 3 Claims

1. A compound of the formula:



where R is tetrahydropyranyl, 4-methyl-5,6-dihydro-2H-pyranyl, arylmethyl, alpha-lower alkoxy-lower alkyl, tri(loweralkyl)silyl, or t-butyl; A and B are individually hydrogen or taken together form a carbon to carbon bond.

4,191,843

PREPARATION OF BISPHENOLS

Arien Kwantes, and Pieter A. Gautier, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 7, 1978, Ser. No. 958,576
Claims priority, application United Kingdom, Nov. 9, 1977, 46644/77
Int. Cl.[2] C07C *37/20, 39/16, 37/00*
U.S. Cl. 568—728 5 Claims

1. In a process for the preparation of bisphenols comprising reacting, in a reaction zone, at least 2 moles of a phenol with a carbonyl compound, at a temperature of from 40° to 95° C., in the presence of an acid ion exchanger, optionally partially modified with a compound having an acidic reacting group and a mercaptan group, and recovering the bisphenols from the reaction zone effluent, the improvement which comprises contacting the reaction zone effluent with an acid ion exchanger in metal salt form and/or a weak base ion exchanger.

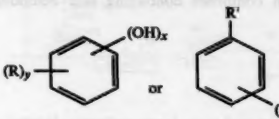
4,191,844

HYDRODEALKYLATION PROCESS AND CATALYST

Geir Bjornson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 4, 1978, Ser. No. 902,651
Int. Cl.[2] C07C *3/00*
U.S. Cl. 568—805 11 Claims

1. A process for the dealkylation of aromatic compounds which comprises contacting hydrogen with at least one substituted monocyclic aromatic compound having at least one of alkyl and hydroxy substituents having the general formulas



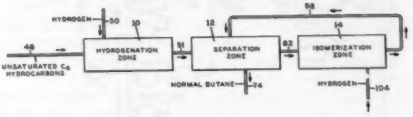
wherein x is 1 to 3, y is 1 to 5, z is 0 to 5, and the sum of x and y is 2 to 6, and wherein R and R′ are alkyl radicals having from 1 to 6, inclusive, carbon atoms, and R″ is hydrogen or a hydrocarbyl radical having from 1 to 6 carbon atoms selected from alkyl and cycloalkyl radicals in the presence of a catalyst consisting essentially of (a) 1–35 weight percent of manganese oxide and (b) the balance of a Group IIA metal oxide under conditions of temperature and pressure sufficient to cause disproportionation and dealkylation to occur at the ortho and para positions of the aromatic ring and produce dealkylated products and small amounts of non-recyclable dehydroxylated products such as benzene, toluene and xylenes, and the like.

4,191,845

PROCESS FOR CONVERTING UNSATURATED C_4 HYDROCARBONS INTO NORMAL BUTANE

Jacob N. Rubin, Newton Highlands, and Frederick B. Seufert, Arlington, both of Mass., assignors to Stone & Webster Engineering Corporation, Boston, Mass.

Continuation-in-part of Ser. No. 896,460, Apr. 14, 1978, abandoned. This application Jul. 25, 1978, Ser. No. 927,919
Int. Cl.[2] C07C *5/04, 5/28, 3/30*
U.S. Cl. 585—253 36 Claims



1. A process of converting unsaturated C_4 hydrocarbons into normal butane which comprises:

a. passing a stream consisting essentially of unsaturated C_4 hydrocarbons in contact with hydrogen in a hydrogenation zone to react said hydrogen and said unsaturated C_4 hydrocarbons to form a stream of normal butane and isobutane;

b. discharging said normal butane and isobutane stream from said hydrogenation zone and introducing said discharged normal butane and isobutane stream into a separation zone to separate said normal butane from said isobutane;

c. discharging and recovering said normal butane from said separation zone;

d. passing said isobutane from said separation zone into an isomerization zone to convert a portion of said isobutane into normal butane so that a stream of normal butane and isobutane is produced; and

e. thereafter returning said stream of normal butane and isobutane produced in said isomerization zone into said separation zone to separate and recover the normal butane produced in said isomerization zone.

4,191,846

CATALYTIC DEHYDROGENATION PROCESS

Floyd Farha, Jr., and Lewis E. Drehman, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 415,943, Nov. 15, 1973, Pat. No. 3,957,688.
This application Jan. 12, 1976, Ser. No. 648,448
Int. Cl.[2] C07C *15/00*
U.S. Cl. 585—440 14 Claims

1. A process for the dehydrogenation of a dehydrogenatable organic compound having from 2 to 12 carbon atoms per molecule in the presence of steam and in the absence of free oxygen which comprises contacting said compound under dehydrogenation conditions with a catalyst composition consisting essentially of:

(a) a metal selected from the group consisting of nickel, palladium, platinum, iridium, osmium and mixtures thereof;

(b) tin; and,

(c) a metal selected from the group consisting of gold and silver and mixtures thereof;

each of said (a), (b) and (c) being supported on a support selected from the group consisting of alumina, silica, magnesia, zirconia, alumino-silicates, Group II aluminate spinels and mixtures thereof.

4,191,847

CIRCUIT ARRANGEMENT FOR DETERMINING INPUT SIGNALS WHICH EXCEED A GIVEN MINIMUM DURATION, IN PARTICULAR FOR TELEPRINTER EXCHANGES

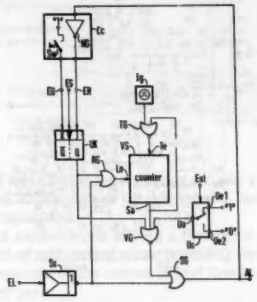
Max Mayer, Unterpfaffenhofen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 1, 1978, Ser. No. 938,984

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1977, 2742525

Int. Cl.[2] H03K *9/08*

U.S. Cl. 178—3 **5 Claims**



1. In a circuit arrangement for determining whether input signals exceed a predetermined minimum duration, in which a delay circuit is triggered by the relevant input signal and a logic circuit is connected to receive the output signals of the delay circuit and connected to also receive the relevant input signal and emits an output signal in response to the duration of the input signal being at least equal to the time delay of the delay circuit, the improvement in combination therewith wherein

said delay circuit comprises a counter including first and second inputs for receiving input control signals and counting signals, respectively, and an output;

and further comprising

another logic circuit including a first input connected to said output of said counter, a second input for receiving control signals and an output connected to the first-mentioned logic circuit; and

control signal means providing first and second control signals, said control signal means including a first input connected to the output of the first-mentioned logic circuit, a second input for receiving the relevant input signal, and an output connected to said first input of said counter and to said second input of said other logic circuit and operable to provide said first control signal to release said counter to count in response to receipt of a first input signal and drive the first-mentioned logic circuit via said other logic circuit to produce an output signal upon reaching a predetermined count, and operable to provide said second control signal to maintain said counter in its rest condition so that the first-mentioned logic circuit remains in a transmissive state for incoming input signals.

4,191,848

TELETYPEWRITER MOTOR CONTROLLING

William M. Kahn, Digital Laboratories, 600 Pleasant St., Watertown, Mass. 02154

Filed Sep. 25, 1978, Ser. No. 945,203

Int. Cl.[2] H04L *7/00*; H04N *1/32*

U.S. Cl. 178—4.1 R **10 Claims**

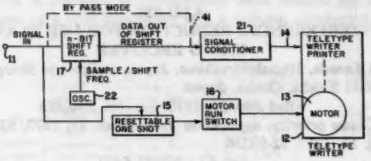
1. Teletypewriter motor controlling apparatus comprising,

motor switching means for selectively enabling the teletypewriter motor,

an input terminal for receiving a teletypewriter signal,

means for periodically sampling the signal received on said input terminal to provide a sequence of sample signals characteristic of the received signal,

means responsive to the occurrence of a transition in a teletypewriter signal on said input terminal for enabling said switching means for a predetermined fixed period longer than the motor start interval for a teletypewriter motor to



attain normal operating speed upon being energized after being in a stationary condition,

means for furnishing a fixed delay to the sample signals slightly greater than said motor start interval,

and means for furnishing the delayed sample signals to the input of a teletypewriter for enabling the latter to print the teletypewriter signal applied to said input terminal only after the teletypewriter motor is at normal operating speed.

4,191,849

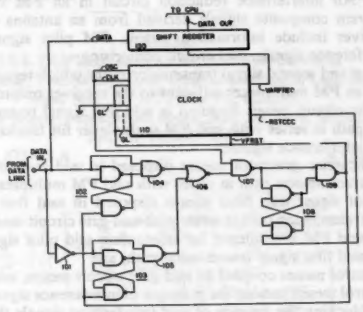
DATA SYNCHRONIZATION CIRCUIT

James J. Vrba, Berwyn, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Oct. 26, 1978, Ser. No. 955,281

Int. Cl.[2] H04L *7/00*

U.S. Cl. 178—69.1 **9 Claims**



1. A data synchronization circuit for receiving data in an automatic identification of outward dialing system connected between a PABX and a telephone central office including a central processing unit, via a data link, said data synchronization circuit comprising:

a clock circuit including a controllable oscillator providing periodic pulses;

register means connected between said data link and said central processing unit and including an input circuit connection from said clock circuit operable in response to receipt of pulses from said clock circuit to store and forward data received via said data link, to said central processing unit;

first latching means connected to said data link for detecting binary state changes operated in response to said received data to produce a first output signal representing each detected state change;

gating means connected to said first latching means and to

said clock circuit for combining said first output signal and said periodic pulses to produce a second output signal;

second latching means connected between said gating means and said clock circuit, operated in response to said second output signal to transmit a reset signal to said clock circuit, whereby said clock circuit generates a clock pulse a fixed time period after each detection of a binary state change to operate said register means.

4,191,850

INTERFERENCES REDUCTION FOR USE IN AN FM RADIO RECEIVER

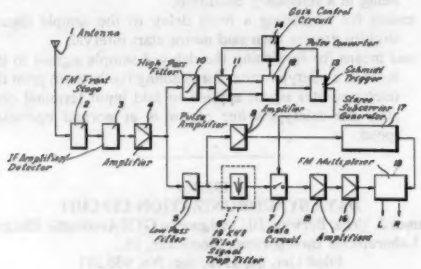
Eiji Tanada, Higashihiroshima, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 16, 1978, Ser. No. 916,353

Claims priority, application Japan, Jun. 17, 1977, 52-72545; Aug. 18, 1977, 52-99250

Int. Cl.² H04H 5/00

U.S. Cl. 179—1 GD **6 Claims**



1. An interference reduction circuit in an FM receiver wherein composite signals derived from an antenna of said receiver include information signals, FM pilot signals and interference signals, said circuit comprising:

first and second signal transmission paths which terminate at an FM multiplexer adjacent to the receiver output;

gate circuit means disposed in said first signal transmission path in series with said FM multiplexer for blocking said interference signals;

subcarrier generator means disposed in said second signal transmission path in series with said FM multiplexer;

pilot signal trap filter means disposed in said first signal transmission path in series with said gate circuit means and said FM multiplexer for attenuating said pilot signals in said first signal transmission path; and

control means coupled to ssid gate circuit means, said control means sensing the presence of interference signals and blocking the passage of said interference signals through said gate circuit means in response thereto.

4,191,851

FM NOISE SUPPRESSOR

Makoto Honma, Hamura, and Takao Inoue, Kodaira, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 28, 1978, Ser. No. 891,032

Claims priority, application Japan, Mar. 30, 1977, 52/34577

Int. Cl.² H04H 5/00

U.S. Cl. 179—1 GD **2 Claims**

1. In an FM stereo demodulation system having

detection means which receives a detected stereo composite signal and which detects a noise pulse in said detected stereo composite signal;

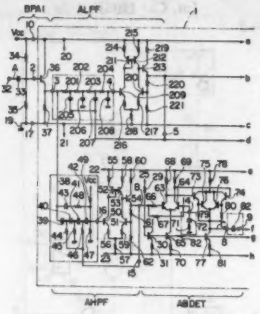
gate means which receives said detected stereo composite signal at a first terminal thereof and a control terminal thereof being controlled by a control signal obtained from said detection means so as to derive a noise-suppressed signal from a second terminal thereof;

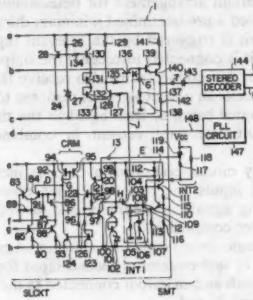
reproduction means which receives said detected stereo composite signal without intervention of said gate means and which reproduces a subcarrier signal for stereo signal demodulation in synchronism with a pilot signal in said detected stereo composite signal; and

an FM stereo demodulation means which receives said noise-suppressed signal and said subcarrier signal so as to derive a left signal and a right signal;

the improvement wherein

said reproduction means comprises a phase locked loop circuit which includes





a phase comparator circuit having a first input coupled to receive said pilot signal and a second input;

a low-pass filter circuit coupled to the output of said phase comparator circuit,

a voltage controlled oscillator circuit coupled to the output of said low-pass filter circuit, and

a frequency divider circuit coupled to the output of said voltage controlled oscillator circuit, the output of said frequency divider circuit providing a 19 KHz signal that is coupled to the second input of said phase comparator circuit.

4,191,852

STEREOPHONIC SENSE ENHANCING APPARATUS

Masao Nishikawa, Seto, Japan, assignor to Shin-Shirasuna Electric Corporation, Nagoya, Japan

Filed May 16, 1978, Ser. No. 906,564

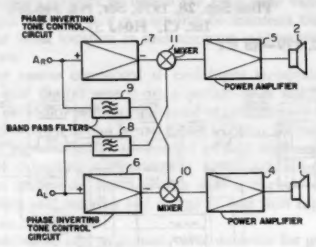
Int. Cl.² H04R 5/04

U.S. Cl. 179—1 G **5 Claims**

1. A stereophonic reproducing apparatus for vectorially composing left and right sound signals applied to left and right loudspeakers, respectively, comprising:

(a) a first and a second phase reversing circuits each having inputs for receiving the left and the right sound input signals and output;

(b) a first band-pass filter having an input connected to the input of said first phase reversing circuit and an output;
(c) a second band-pass filter having an input connected to the input of said second phase reversing circuit and an output;
(d) a first mixer circuit having a first input connected to the



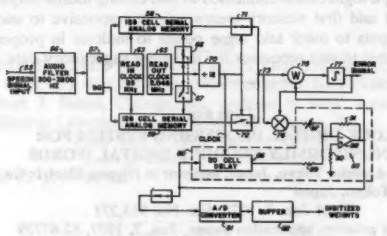
output of said first phase reversing circuit, a second input connected to the output of said second band-pass filter, and an output; and
(e) a second mixer circuit having a first input connected to the output of said second phase reversing circuit, a second input connected to the output of said first band-pass filter, and an output.

4,191,853

SAMPLED DATA FILTER WITH TIME SHARED WEIGHTERS FOR USE AS AN LPC AND SYNTHESIZER

Gregory H. Piesinger, Scottsdale, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Oct. 10, 1978, Ser. No. 950,203
Int. Cl.[2] G10L 1/00
U.S. Cl. 179—1 SA **20 Claims**



1. A speech analyzer comprising:
(a) delay means connected to receive an input signal and provide a series of output signals simulating a multitap delay line;
(b) weighting means adjustable to substantially null out signals applied thereto and provide output signals indicative of the weighting means adjustment and any error; and
(c) time sharing means coupling the weighting means to the delay means for providing a weighting means adjustment and an error signal for each of the series of output signals.

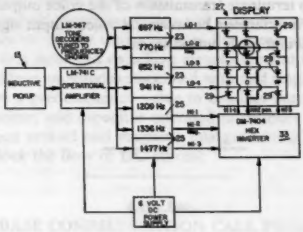
4,191,854

TELEPHONE-COUPLED VISUAL ALPHANUMERIC COMMUNICATION DEVICE FOR DEAF PERSONS

George A. Coles, 2917 S. Fifth St., Springfield, Ill. 62703

Filed Jan. 6, 1978, Ser. No. 867,535
Int. Cl.[2] H04M 11/06
U.S. Cl. 179—2 R **3 Claims**

1. A receiver for converting alphanumeric two-frequency electrical signals transmitted from a push-button telephone to visible signals at a message-receiving station, said receiver comprising: an inductive pickup easily removably attachable to a telephone constituting part of said message-receiving station, an amplifier having its input connected to said inductive pickup for amplifying received electrical signals, a bank of differently tuned high-frequency detectors, a bank of differently tuned low-frequency detectors, said amplifier having its output connected to the input of said detectors, a display having a plurality of row conductors and a plurality of column conductors, a plurality of cross-points each formed by the intersection of a row conductor and a column conductor, a



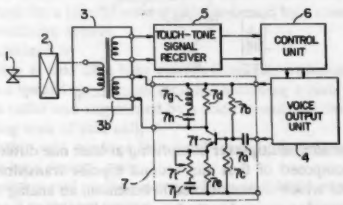
plurality of light-emitting diodes each connected between a row conductor and a column conductor at each cross-point, each high-frequency detector being connected to one of said column conductors and each low-frequency detector being connected to one of said row conductors, an inverter unit inserted between either the high-frequency or the low-frequency bank of detectors and the its connected conductors, and a power supply for said receiver, said receiver being electrically conductively isolated from the telephones at the sending and receiving stations.

4,191,855

FULL DUPLEX AUDIO RESPONSE DEVICE

Hisao Sakai, Yokohama, Japan, assignor to Hitachi, Ltd., Japan

Filed Aug. 26, 1977, Ser. No. 828,101
Claims priority, application Japan, Aug. 26, 1976, 51-101883
Int. Cl.[2] H04M 11/00
U.S. Cl. 179—2 A **4 Claims**



1. A full duplex audio response device for use with a terminal set such as a push button calling telephone set for generating push button signals and receiving voice signals, comprising:
push button signal receiving means;
voice output means for generating a voice output signal;
a hybrid circuit coupled between said push button signal receiving means and said terminal set, wherein said push button signal receiving means receives push button from said terminal set through said hybrid circuit;
a band-pass filter coupled between said voice output means and said hybrid circuit for filtering out frequency components of the voice output signal which lie within the bandwidth of a particular push button signal, wherein said voice output signal is passed to said terminal set through said band-pass filter and said hybrid circuit;

control means coupled between said push button signal receiving means and said voice output means to control said voice output means in accordance with push button signals received by said push button receiving means and to terminate transmission of said voice output signal upon said voice output means only upon the reception of said particular push button signal;

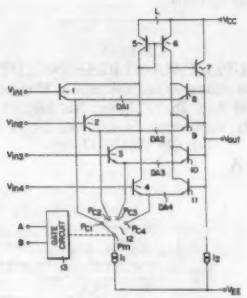
wherein when said hybrid circuit simultaneously receives said voice output signal through said band-pass filter and said particular push button signal from said terminal set, said particular push button signal will activate the control means to terminate transmission of the voice output signal without interference between the voice output signal and the particular push button signal.

4,191,856

ANALOG MULTIPLEXER

Katsumi Nagano, and Yasuo Taguchi, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 28, 1978, Ser. No. 929,022
Claims priority, application Japan, Jul. 29, 1977, 52-91150
Int. Cl.[2] H03K *19/40*; H04J *3/04*
U.S. Cl. 179—15 A **6 Claims**



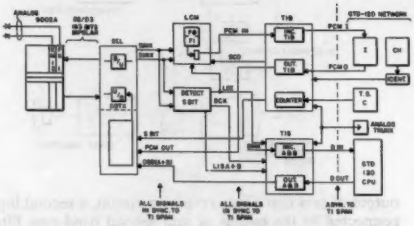
1. An analog multiplexer comprising at least one differential circuit composed of first and second bipolar transistors the emitters of which are connected in common, an analog signal input terminal connected to the base of said first bipolar transistor, an analog output terminal connected to the base of said second bipolar transistor, a load composed of a current mirror connected between the collectors of said first and second bipolar transistors and one terminal of a power source, a first constant-current source, a switch circuit with one terminal connected to the common junction of the emitters of said first and second bipolar transistors and the other terminal connected to the other terminal of said power source through a first constantcurrent source, control circuit means for controlling the conductivity between said terminals of said switch circuit, output circuit means responsive to the signal at said collector of said second bipolar transistor for connecting said one terminal of the power source to said analog output terminal, and a second constant-current source connected between said analog output terminal and said other terminal of the power source.

4,191,857

DIGITAL TRUNK SUPERVISORY DECODER MULTIPLEXOR FOR GROUND START OR E&M SIGNALLING ON A COMMON T1 SPAN

Donald W. McLaughlin, Naperville; Julius Jusinskas, Jr., Glen Ellyn, both of Ill; assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Sep. 28, 1978, Ser. No. 946,890
Int. Cl.[2] H04J *3/12*
U.S. Cl. 179—15 BY **7 Claims**



1. In a pulse code modulated control processor controlled time division communication switching system, a universal interface arrangement for the conversion of supervisory data from a first format utilized by a multi-channel carrier system to a second format utilized by said switching system and comprising:

a first memory arranged to receive and store supervisory data incoming from said carrier system and including an output means, coding means having an output indicating the type of format utilized by said carrier system and also the supervisory format required by the trunks connected via said channels of said carrier systems;

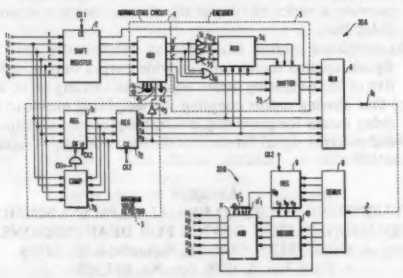
a plurality of sense points accessable by said central processor, a logic means connected to said coding means output and said first memory means output, responsive to said outputs to mark said sense points to indicate in proper format to said processor the incoming supervisory data.

4,191,858

BLOCK DIGITAL PROCESSING SYSTEM FOR NONUNIFORMLY ENCODED DIGITAL WORDS

Takashi Araseki, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jun. 7, 1978, Ser. No. 913,271
Claims priority, application Japan, Jun. 7, 1977, 52-67739
Int. Cl.[2] H03K *13/22*
U.S. Cl. 179—15.55 **8 Claims**



1. A block digital processing system for nonuniformly encoded digital words including a transmitter digital processor for encoding samples of a speech signal in blocks of a predetermined number of samples, and a receiver digital processor for

decoding said encoded digital words into said speech signal, wherein said transmitter digital processor comprises:

a plurality of input terminals adapted to receive nonuniformly encoded digital words which have been obtained by preliminarily encoding the respective samples of said speech signal and each of which consists of a sign bit to indicate the polarity of said sample, a plurality of segment bits to indicate a range to which the amplitude value of said sample belongs and a plurality of mantissa bits to indicate at what location in said segment said amplitude value exists;

shift register means connected to said input terminals for delaying said digital words by a period of n times the sampling period of said speech signal to temporarily store said samples equal in number to said n (n being an ineger);

a maximum value detector connected to said shift register means for detecting a first digital word indicating the maximum amplitude value among said n digital words representing said samples and stored in said shift register means;

means connected to said maximum value detector for generating a correction value so that a second digital word consisting of said segment bits and at least the most significant bit of said mantissa bits from said shift register means can be converted into a third digital word which includes said segment bits in said first digital word representative of the maximum amplitude value and which includes a maximum value that can be represented by said at least the most significant bit in said first digital word and that is concatenated subsequently to the least significant bit of said segment bits;

normalizing means receiving said correction value and connected to said shift register means for converting the second digital word given from said shift register means into a normalized digital word with said correction value;

reencoder means responsive to said third digital word from said normalizing means for uniformly quantizing said third digital word; and

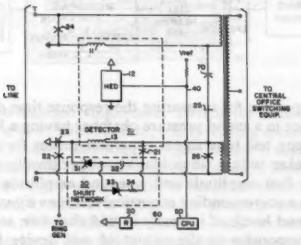
a multiplexer for transmitting the output code of said reencoder means and said block code in a multiplex fashion.

4,191,859

LOOP, DIAL PULSE AND RING TRIP DETECTION CIRCUIT WITH CAPACITIVE SHUNT NETWORK

Robert J. Sabon, Chicago, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Nov. 1, 1978, Ser. No. 956,547
Int. Cl.[2] H04B *3/46*; H04M *3/02*
U.S. Cl. 179—18 FA **7 Claims**



1. A telephone subscriber loop, dial pulse and ring trip detection circuit, for use in a telephone switching system including a central processing unit, at least one subscriber station including a ringer, a hookswitch and a calling device, said station connectable through said hookswitch to said detection circuit via a subscriber loop circuit, said switching system further including a ringing generator operated to generate an AC ringing voltage superimposed on DC battery, and a ringing relay connected to said central processing unit, said relay operated in response to said central processing unit to connect said ringing generator to said subscriber loop circuit, said detection circuit comprising:

magnetic flux generating means included in said subscriber loop circuit operated to generate a magnetic flux in response to current flow associated with said ringing voltage through said magnetic flux generating means;

magnetic flux detection means located in magnetic field proximity to said magnetic flux generating means, normally operated in response to an absence of magnetic flux to generate a first output signal, and further operated in response to the presence of said magnetic flux to generate a second output signal; and

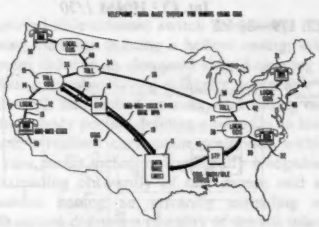
first threshold switching means and capacitor means series connected across said magnetic flux generating means, said first threshold switching means operated in response to voltage amplitudes associated with said ringing voltage above a predetermined value to conduct current to said capacitor, said capacitor operated to conduct alternating current around said magnetic flux generating means and to block the flow of DC current.

4,191,860

DATA BASE COMMUNICATION CALL PROCESSING METHOD

Roy P. Weber, Bridgewater, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 13, 1978, Ser. No. 924,170
Int. Cl.[2] H04M *3/42, 7/06*
U.S. Cl. 179—18 B **23 Claims**



1. A method of deriving call routing information from a data base system for a special service call processed by a communication switching system

characterized by

receiving at said data base system from said switching system a special service call message including a code dialed by a caller and augmented by a code identifying the originating area of said call,

translating said message into a call routing message at said data base system, and

transmitting said routing message from said data base system to said switching system.

4,191,861

TELEPHONE AMPLIFIER

Wesley F. Walker, Jr., Ringgold, Ga., assignor to Walker Equipment & Service Co., Ringgold, Ga.

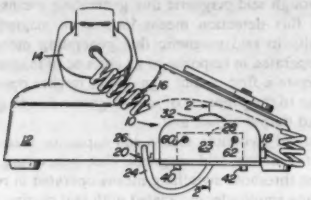
Continuation-in-part of Ser. No. 761,932, Jan. 24, 1977, Pat. No. 4,151,376. This application Jun. 6, 1977, Ser. No. 803,509
Int. Cl.[2] H04M *1/60*
U.S. Cl. 179—81 B **5 Claims**

1. A telephone amplifier for connection to a telephone set and a telephone handset associated therewith, the telephone set having a modular plug receptacle and the handset having a cord and a modular plug connected thereto, comprising;

a housing having a modular plug receptacle for receiving said modular plug associated with said telephone handset cord;

means for mounting said housing on a wall of said telephone set;

an amplifier modular plug and a cord connected thereto, said amplifier modular plug being adapted for insertion into said modular plug receptacle in the telephone set;



a transformer disposed within said housing and connected to said amplifier modular plug and cord; and

amplifier means, disposed within said housing, having an output and an input, said output being connected to said housing modular plug receptacle and said input being connected to said transformer.

4,191,862

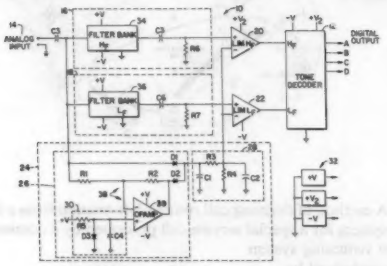
DUAL FREQUENCY TONE DECODER

Raymond J. Hughes, San Jose, Calif., assignor to Rolm Corporation, Santa Clara, Calif.

Filed Aug. 7, 1978, Ser. No. 931,595

Int. Cl.[2] H04M *1/50*

U.S. Cl. 179—84 VF **6 Claims**



1. In combination with circuitry for comparing instantaneous amplitude of input line signals and a threshold level signal and operative in response to said input line signals exceeding said threshold level signal to generate logic level signals in the form of a repetitive pulse train at frequencies of said input line signals suitable as final output signals to a telephone system digital tone decoder, circuit means for suppressing final output signals caused by short-term transient oscillations, said circuit means comprising:

means coupled to said input line signals for sensing amplitude levels of said input line signals;

means responsive to output signals of said amplitude sensing means, and coupled to said comparing circuitry for generating a signal directing the establishment of a threshold level, wherein the generated signal is adapted to be provided to said comparing circuitry prior to availability of signals representative of said input line signals such that at least the initial transient portion of said representative signals is not propagated through said comparing circuitry; and

means coupled to said comparing circuitry to delay input to said comparing circuitry of signals representative of said input line signals.

4,191,863

SUPPORT FOR MULTI-POINT MAGNETIC DRIVER LOUDSPEAKER

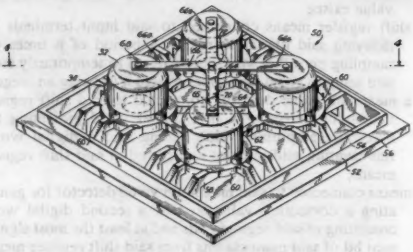
Atsushi Matsuda, Tokyo, and Jun Kishigami, Urawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 27, 1978, Ser. No. 963,903

Claims priority, application Japan, Nov. 26, 1977, 52-141852

Int. Cl.[2] H04R *9/06*

U.S. Cl. 179—115.5 R **11 Claims**



5. A flat-plate loudspeaker comprising:

a substantially flat diaphragm having a front surface and a rear surface;

a frame surrounding the perimeter of said diaphragm;

a plurality of spaced apart magnetic drivers magnetically connected to said rear surface;

support means connected to said frame for supporting said magnetic drivers at the ends thereof nearer said rear surface; and

stiffening means connecting together at least two of said magnetic drivers at the ends thereof remote from said rear surface.

4,191,864

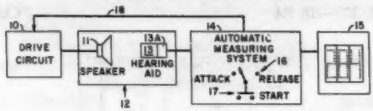
METHOD AND APPARATUS FOR MEASURING ATTACK AND RELEASE TIMES OF HEARING AIDS

Joshua E. Sopher, Berkeley, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Aug. 25, 1978, Ser. No. 936,735

Int. Cl.[2] H04R *29/00*

U.S. Cl. 179—175.1 A **22 Claims**



1. Apparatus for measuring the response time of an acoustical device in a sound pressure chamber having a loud-speaker, comprising test tone signal generator means for exciting said loudspeaker with a sinusoidal signal peridically switched between a first amplitude and a second amplitude and thereby creating a corresponding acoustical test tone signal having first and second levels of intensity in said chamber; storage circuit means responsive to the output of said device for storing a signal representative of the steady state response of said device to said acoustical test tone signal at one of said levels of intensity; first circuit means receiving the output response of said device for generating an enable signal when said response is outside a predetermined recovery range relative to said stored signal; time measuring circuit means for measuring cumulative time lapse; timing circuit means for generating an initiation signal in timed relation with a change of said intensity to said one level of intensity from the other level, said initiation signal enabling said time measuring circuit means to commence measuring time lapse, said enable signal of said first circuit means

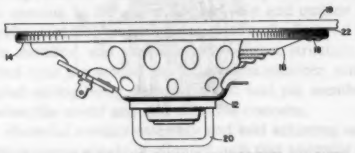
terminating said measurement by said timing circuit means when said response signal is within said recovery range.

4,191,865

LOUDSPEAKER PADRING AND METHOD OF MAKING THE SAME

John A. King, Mentor, and Douglas W. O'Brien, Rocky River, both of Ohio, assignors to Essex Group, Inc., Fort Wayne, Ind.

Filed Oct. 12, 1978, Ser. No. 950,934
Int. Cl.² H04R *1/00, 9/02*
U.S. Cl. 179—178 **16 Claims**



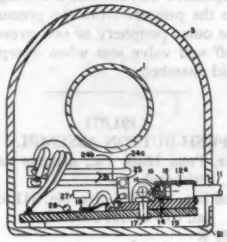
1. In a loudspeaker assembly having a frame upon which the loudspeaker components are mounted and by which said loudspeaker is mounted on a baffle, and an improved padring gasket carried on said frame and situated between said frame and baffle, wherein said improved padring gasket is formed from a hot melt type material.

4,191,866

THREE-FUNCTION SWITCH FOR A MOTORCYCLE

Kunihiko Nakajima, Hamakita; Kyoshi Sato; Toshimitsu Iio, both of Hamamatsu, and Atsushi Kanda, Iwata, all of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jul. 8, 1977, Ser. No. 813,843
Claims priority, application Japan, Jul. 14, 1976, 51/93571[U]
Int. Cl.² H01H *9/00;* B60Q *1/26*
U.S. Cl. 200—4 **5 Claims**



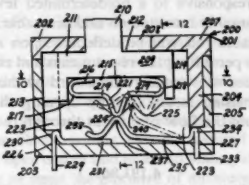
1. A three-function single-lever switch for a motorcycle comprising: a base; a first mount; a first bearing means having a first axis of rotation mounting said first mount to said base for rotation around said first axis; a second mount; a second bearing means having a second axis of rotation mounting said second mount to said first mount for rotation around said second axis; a slider slidably mounted to said second mount, said slider having a free end distant from said second mount, said second mount having a third axis along which said slider is slidable, said first and second axes intersecting and being normal to one another; first and second switch means respectively operably interposed between the base and the first mount and between the first and the second mounts, each of said switch means having a first and a second switching condition established by their angular position around their respective axis, and the third switch means operably interposed between the second mount and the slider, said third switch means having a first and a second switching condition established by the axial position of the slider relative to the second mount, the movement of the first mount relative to the base being limited to rotation around the second axis, and movement of the slider relative to the second mount being limited to axial movement along said third axis, cover means enclosing said mounts and having an opening through which said free end of the slider projects, whereby simultaneous manual contact of the free end and of the first or second mount is not possible, nor is there a sufficient length of slider projecting from the cover means that the operator can contact its side while depressing the slider.

4,191,867

MINIATURE SWITCHES

Donavon L. Feaster, New Bedford, Mass., assignor to Sonitronics, Inc., Flushing, N.Y.

Division of Ser. No. 774,318, Mar. 4, 1977, Pat. No. 4,117,280.
This application Aug. 7, 1978, Ser. No. 939,634
Int. Cl.² H01H *15/02*
U.S. Cl. 200—16 R **1 Claim**



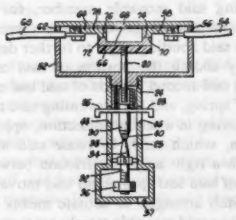
1. An improved slide-actuated switch comprising: first and second housing elements defining a hollow casing; said first housing element defining an elongated slotted opening therethrough, a sliding member having manually engageable means projecting through said slotted opening, said sliding member including a main body portion defining a recess in an inwardly facing surface; a resilient cam means positioned within said recess, said cam means including a generally wedged-shaped projection extending outwardly of said recess; said second housing element having an inwardly extending septum thereon, said septum defining a plurality of detents selectively engaging said projection; and a pair of electrically conductive contact elements disposed in overlapping relation within said casing, one of said contact elements having cam follower means thereon slidably engaging said projection on said cam means, said cam follower, when said contacts are in closed condition being positioned in the area of one of said detents.

4,191,868

SEISMIC SAFETY CUTOFF SWITCH

Paul B. Sunde, 11356 Baird Ave., Northridge, Calif. 91324

Division of Ser. No. 745,483, Nov. 26, 1976, Pat. No. 4,131,124.
This application Aug. 25, 1978, Ser. No. 936,782
Int. Cl.² H01H *35/14*
U.S. Cl. 200—61.5 **2 Claims**



1. An improved seismic safety cutoff device for use with an

electrical switch device, of the type having an electrical contactor housing and a control stem, for interrupting the flow of current in an electrical circuit, the improvement comprising:

(a) housing means connected to the electrical contactor housing;

(b) switch re-set means disposed within said housing means, said switch re-set means having a lever extending outward through said housing, for re-positioning the control stem without disassembly of the cutoff device after the flow of current in said electrical circuit has been interrupted, and for providing a visual indication of switch position;

(c) resilient biasing means vertically disposed within said housing means for exerting a force upon said switch re-set means and urging said switch re-set means and control stem to a switch-open position;

(d) a substantially vertically-mounted pivotable rod within said housing means for engaging and retaining the control stem in it's switch-closed position, the pivotable rod being position-oriented by the force of gravity; and

(e) means responsive to a predetermined level of seismic force adjustably mounted on said pivotable rod, whereby the pivotable rod will be deflected upon application of said force permitting the re-set means and control stem to be displaced substantially downward by the action of the resilient biasing means thereby opening the switch and interrupting the flow of current through the switch.

4,191,869

VIBRATION DETECTOR DEVICE

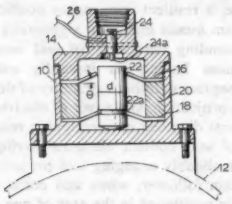
Katsufusa Tanaka, and Isamu Tanakura, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 14, 1978, Ser. No. 924,827

Claims priority, application Japan, Jul. 19, 1977, 52-86802

Int. Cl.[2] G01P *15/02*; H01H *35/14*

U.S. Cl. 200—61.45 R **4 Claims**



1. A vibration detector device for detecting vibration in an appliance comprising:

a main detector body for mounting on the appliance whose vibration is to be detected;

a movable member movable in response to vibration of said appliance;

at least one leaf spring, having a first portion secured to said main detector body and a second portion abutting said movable member at an angle other than a right angle, for supporting said movable member, for permitting said movable member to move in a first direction which tends to cause said abutting angle to further depart from a right angle by sliding the portion of said movable member abutting said second portion of said leaf spring away from said leaf spring, and for preventing said movable member from moving in a second direction, opposite to said first direction, which tends to cause said abutting angle to approach a right angle by friction between said second portion of said leaf spring and said movable member; and

a limit switch arranged to actuate means for generating a signal when said movable member moves a predetermined amount in said first direction so as to contact the limit switch.

4,191,870

PRESSURE RESPONSIVE SWITCH HAVING PROTECTION FROM OVERPRESSURE OF SOURCE

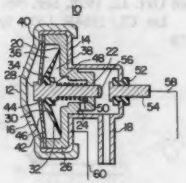
Syozo Yanagisawa, Tokaimura, and Shigewo Ishikawa, Katsuta, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 7, 1978, Ser. No. 958,559

Claims priority, application Japan, Nov. 7, 1977, 52-132500

Int. Cl.[2] H01H *35/34*

U.S. Cl. 200—83 P **4 Claims**



1. A pressure responsive switch having a protection, from overpressure of a pressure source comprising:

a housing having a valve seat thereon;

a pressure responsive wall having an outer resilient peripheral portion press-fitted to said valve seat by elasticity thereof, and for forming a chamber together with said housing;

an actuating shaft rigidly fixed to the center portion of said pressure responsive wall and movable in the axial direction thereof;

a pair of contacts, the closing and opening of which are in response to the axial movement of said actuating shaft;

a snap-action plate connected to said actuating shaft and said housing for responding to the movement of said actuating shaft and changing rapidly said contacts from one position to the other position; and

means for applying pressure to the chamber formed of said pressure responsive wall and said housing, whereby differential pressure is produced between both sides of said pressure responsive wall and said actuating shaft moves in response to the pressure from the pressure source; and wherein the outer periphery of said pressure responsive wall lifts off said valve seat when overpressure is produced in said chamber.

4,191,871

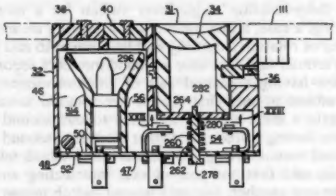
PUSH-BUTTON ASSEMBLY

Forrest E. Coyle, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 12, 1978, Ser. No. 941,617

Int. Cl.[2] H01H *3/12, 9/02*

U.S. Cl. 200—159 R **13 Claims**



1. A push-button assembly, comprising:

a housing having a cavity, and recess which communicates with the cavity,

an elongated actuating member having first and second ends, and a longitudinal axis which extends therebetween,

means mounting said actuating member for movement in said recess, said mounting means orienting the actuating

member to a predetermined position about its longitudinal axis while preventing rotation of the actuating member about said longitudinal axis,

a cover mounted on said housing to cover the cavity therein,

and an electrical contact assembly mounted on said cover, within the cavity of said housing, said electrical contact assembly being located on said cover in a predetermined position selected such that assembly of said cover on said housing orients it with said actuating member, said electrical contact assembly including stationary contacts fixed to the cover, a movable contact structure, a pin member having first and second ends, a stop member, and a spiral spring member, said pin member being disposed through an opening in the cover with its first end outside of the cavity, said stop member being fixed to the first end of said pin member, and said movable contact structure being fixed near the second end of said pin member, with said spiral spring being disposed about said pin member, between the cover and said movable contacts,

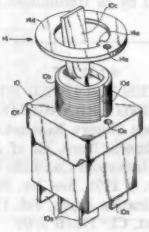
said electrical contact assembly and said actuating member being cooperatively configured such that assembly of said cover on said housing operatively couples said actuating member and said electrical contact assembly, with the second end of the actuating member including alignment means which cooperate with said movable contact structure to orient and provide lateral support therefor, when the cover is assembled with the housing.

4,191,872

SWITCH CASE WITH STACKABLE LOCK WASHER

Richard W. Sorenson, Avon, Conn., assignor to Carlingswitch, Inc., West Hartford, Conn.

Filed Mar. 14, 1979, Ser. No. 20,489
Int. Cl.[2] H01H *9/02*; F16B *43/00*
U.S. Cl. 200—296 **3 Claims**



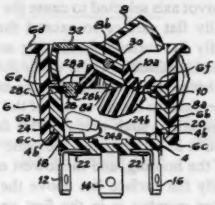
1. In a switch having a case and a threaded barrel with a slot extending from one end of the barrel to the switch case, said switch being for use in a panel with a circular opening for receiving the barrel, and the panel further including a locating hole adjacent to the circular opening for orienting the switch angularly with respect to the panel, the improvement comprising a series of stackable washers, each of which washers is adapted to be slidably received on the switch barrel for use in spacing the switch casing axially relative to the panel, each said washer having a radially inwardly projecting tab adapted to fit slidably in the barrel slot, each said washer further having axially spaced upper and lower faces, one of said faces having a projecting post defined therein adapted to be received in the panel locating hole, and the other of said washer faces defining a post opening for receiving the post on an adjacent washer, whereby each of said washers can be used not only as a washer for axial spacing of the switch with respect to the panel, but also for use in locating the switch angularly with respect to the panel.

4,191,873

ILLUMINATED SEALED ROCKER SWITCH

Tony O. Woodard, Pine Level, N.C., assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 26, 1979, Ser. No. 15,350
Int. Cl.[2] H01H *9/04, 9/16*
U.S. Cl. 200—302 **3 Claims**



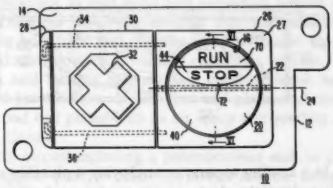
1. In an electric switch having a base housing the switching mechanism, a rocker actuator pivotally movable to effect operation of the switching mechanism, a frame mounted on the open-end of the base and affording pivotal support for the rocker, and a lamp mounted in said base illuminable to provide indication of a switch operating position, the improvement comprising, an elastic sealing member secured between said frame and the open end of said base and sealing about a portion of said rocker to resist the entrance of moisture, dust and the like into said base, a light transmitting lens mounted in sealing member in alignment with said lamp, and a window mounted in said rocker to align which said lens and said lamp in a given position of said rocker to provide light transmission exteriorally of said switch.

4,191,874

MANUALLY OPERABLE SWITCH

Denis E. Bedel, Ross, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 12, 1978, Ser. No. 941,611
Int. Cl.[2] H01H *3/02*
U.S. Cl. 200—339 **2 Claims**



1. A switch which facilitates actuation by choice in a preferred direction, while minimizing accidental actuation in this direction, comprising:

a housing having a substantially flat, vertically oriented, front surface,

an electrical contact assembly mounted in said housing, said electrical contact assembly being operable between first and second positions,

and an actuator member pivotally mounted in said housing on a horizontally oriented pivot axis,

said actuator member having a first portion accessible from the outside of said housing, and a second portion within the housing operatively linked with said electrical contact assembly,

said first portion having a generally spheroidal configuration, with an indentation therein for pivotally operating

said actuator member between first and second angular positions which select the first and second positions, respectively, of said electrical contact assembly,

said indentation in the first portion of the actuator member including first and second substantially flat, intersecting surfaces for operating the actuator member to its first and second positions, respectively, with their planes having predetermined different spacings from the horizontally oriented pivot axis selected to cause the area of the second substantially flat surface to exceed the area of the first substantially flat surface, facilitating actuation by choice to its second position,

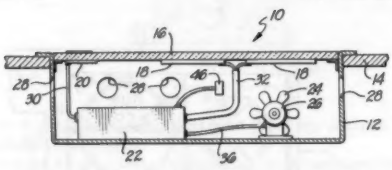
said first and second flat surfaces being oriented relative to one another, and to the pivot axis of the generally spheroidal configuration, such that the flat first surface of the indentation is in substantially the same plane as the front surface of the housing, and the lowest edge of the second substantially flat surface lies above the pivot axis, when the actuator member is in the first angular position, to minimize accidental operation of the actuator member to its second position and to preclude a force applied to the actuator member in a direction perpendicular to the front surface of the housing from operating the actuator member to its second condition.

4,191,875

FAN SPEED CONTROL USED IN INDUCTION COOKING APPARATUS

Ronald J. Cunningham, 320 Patrician Way, Pasadena, Calif. 91105

Filed Nov. 10, 1977, Ser. No. 850,297
Int. Cl.² H05B 9/02
U.S. Cl. 219—10.49 R **8 Claims**



1. In a heating apparatus employing a plurality of induction heating elements, electronic means for controlling the operation of said heating elements, wire means connecting said heating elements with said electronic means for the purpose of supplying power to said heating elements and an electric fan for cooling said electornic means, the improvement which comprises:

heatable means inductively heated by the passage of current through said wire means and located adjacent to said wire means intermediate said electronic means and said heating elements,

temperature sensing means including a sensing element located adjacent to said heatable means, and

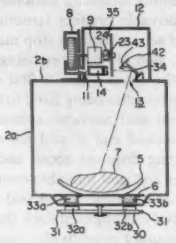
switch means responsive to said temperature sensing means for controlling the operation of said electric fan independently of the operation of said heating elements and at a variable speed proportional to the degree of induction heating of said heatable means.

4,191,876

MICROWAVE OVEN HAVING RADIATION DETECTOR

Masaru Ohkubo, Yamatokoriyama, and Tadayuki Onoda, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 10, 1978, Ser. No. 923,157
Claims priority, application Japan, Jul. 15, 1977, 52-85502
Int. Cl.² H05B 9/06
U.S. Cl. 219—10.55 B **5 Claims**



1. A microwave oven with a radiation detecting device of the type for controlling the microwave output in response to the detected radiation from food characterized by the provision of

(a) a turntable upon which food to be heated is placed,

(b) a reflecting mirror for scanning said turntable linearly in the diametrical direction thereof, the rotational speed of said reflecting mirror being in synchronism with that of said turntable,

(c) a chopper for interrupting the beam of radiation redirected by said reflecting mirror, and

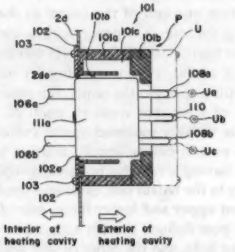
(d) a radiation detector for intercepting the beam of radiation transmitted through said chopper, thereby generating the signal representative of the difference between the amount of radiation from said food and the amount of radiation chopped by or transmitted through said chopper.

4,191,877

MICROWAVE OVEN EQUIPPED WITH ELECTRIC HEATING ARRANGEMENT

Junzo Tanaka, Fujiidera; Shigeru Kusunoki, Yamatokoriyama, and Hirofumi Yoshimura, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 4, 1978, Ser. No. 893,312
Claims priority, application Japan, Jul. 11, 1977, 52-83182
Int. Cl.² H05B 9/06
U.S. Cl. 219—10.55 B **11 Claims**



1. A microwave oven which comprises:

(a) an oven defining structure;

(b) a heating cavity defined by wall members within said oven defining structure and having an access opening at

one side thereof; one of said wall members having a power feeding opening therein;

(c) a door member adapted to selectively open and close said access opening;

(d) means for supplying microwave energy into said heating cavity for dielectric heating of an object to be heated placed therein;

(e) electric heating means provided in said heating cavity for electrically heating the object to be heated in said heating cavity, said electric means having a heater element which includes a heater portion having heater member and a sheath means surrounding said heater member and a power supplying base portion having power supplying electrodes sealed therein connected to said heater portion and projecting out of said base portion; and a power feeding section mounted on said one of said wall members at said power feeding opening and having a recess therein for receiving, through said power feeding opening, said power supplying base portion of said heater element, said power feeding section having jacks therein for receiving said power supplying electrodes therein in electrical contact therewith, and a choke structure on said power feeding section extending around the power feeding opening and having a choke opening facing into said recess in spaced opposed relationship with the periphery of said power supplying base portion, whereby sealing of high frequency waves is achieved between said power supplying base portion and said choke structure.

4,191,878

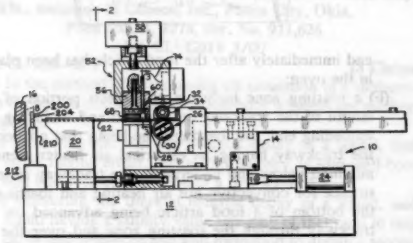
ELECTRODE POSITIONING GAGE FOR MULTIPLE ELECTRODE ELECTRICAL DISCHARGE MACHINING APPARATUS

John M. Check, Chelsea, and Gary F. Rupert, Ann Arbor, both of Mich., assignors to Raycon Corporation, Ann Arbor, Mich.

Continuation-in-part of Ser. No. 662,025, Feb. 27, 1976, Pat. No. 4,044,216. This application Aug. 19, 1977, Ser. No. 825,970

Int. Cl.² B23P 1/12

U.S. Cl. 219—69 E **2 Claims**



1. In electrical discharge machining apparatus for forming a plurality of side-by-side holes of small diameter in a workpiece, said apparatus including a plurality of side-by-side wire electrodes, means for advancing said electrodes toward said workpiece during machining and for retracting said electrodes to positions spaced from said workpiece after machining, said electrodes being operable when maintained in positions spaced from said workpiece distances corresponding to an anti-short distance to erode material from said workpiece so as to form the desired holes therein, means for refeeding said electrodes from said retracted positions to compensate for erosion thereof during machining, and a gage member having an electrode engaging surface and being movable to a blocking position between and in general alignment with said workpiece and said retracted electrodes wherein said electrode engaging surface defines a reference surface spaced from said workpiece a distance at least as great as and substantially equal to said anti-short distance, said refeed means being operable to advance said electrodes into engagement with said reference surface in said blocking position to locate said electrodes in reference positions relative to said workpiece in which the distances between each of said electrodes and said workpiece is at least as great as and substantially equal to said anti-short distance, said refeeding means comprising drive means frictionally engageable with said electrodes and operable to apply sufficient force to said electrodes to advance the electrodes into engagement with said reference surface, said drive means being slippable on the ones of said electrodes engaged with said reference surface.

4,191,879

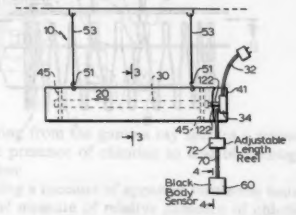
HEATING APPARATUS AND CONTROLS THEREFOR

Charles F. Kerchner, Jr., R.D. 3, Box 174A, Northampton, Pa. 18067

Continuation of Ser. No. 610,636, Sep. 5, 1975, abandoned. This application Jun. 20, 1977, Ser. No. 807,831

Int. Cl.² H05B 1/02

U.S. Cl. 219—358 **2 Claims**



1. Heating and control apparatus for warming chicks and the like comprising

an elongated hood having a generally triangular cross-section and made up of an elongated main body portion having first and second open ends,

first end plates secured in said open ends of said hood and inwardly thereof,

second end plates secured in said open ends of said hood to close said open ends of said hood,

said second end plates having inner and outer surfaces,

an elongated infrared heating element mounted within said hood and extending between said first end plates and directly connected to said first end plates,

a curved reflector in said hood and extending behind said heating element and between said first end plates for reflecting heat from said element away from said hood,

a semiconductor control circuit for regulating current flow through said heating element said control circuit being mounted between one of said first end plates and one of said second end plates with an air space surrounding said control circuit,

said control circuit including a potentiometer and an elongated support plate, at least one circuit module mounted on said support plate, means for connecting said circuit to a power supply and to said heating element, and other means for connecting said circuit to a remote thermal sensor, said other means including a cable and an adjustable length reel,

said control circuit being held rigidly in place, with said support plate held upright between and generally parallel to said first and second end plates, by means of a shaft of said potentiometer having one end secured to said support plate and the other end thereof secured to and extending through said one second end plate, the other end of said shaft carrying a potentiometer adjustment knob adjacent to the other surface of said one second end plate, and

a black body sensor secured to the end of said cable remote from said hood and adjustably mounted beneath said hood by said adjustable length reel and said cable and electrically connected in said control circuit by said cable, said

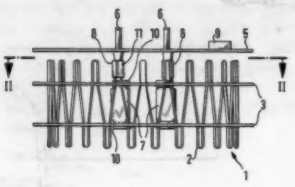
black body sensor comprising a cylinder having top and bottom walls and a side wall, said side wall having a black outer surface and having an opening in said bottom wall and having a semiconductor sensor secured inside said cylinder to the upper wall thereof and connected by said cable to said control circuit.

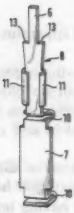
4,191,880

HEATING ELEMENT FOR ELECTRICAL APPLIANCE HAVING A BLOWER

Klaus Meywald, and Helmut Ohnmacht, both of Kandel, Fed. Rep. of Germany, assignors to Firma Fritz Eichenauer, Fed. Rep. of Germany

Filed May 11, 1978, Ser. No. 904,882
Int. Cl.[2] H05B *3/02*; F24H *3/04*
U.S. Cl. 219—375 **6 Claims**





1. A heating element for an electrical appliance having a blower, the heating element comprising a meander-form winding of resistance heating wire, a plurality of supporting plates arranged in parallel to an incident flow direction of air produced by the blower, the supporting plates being provided with openings for accommodating turns of the winding, and metallic spacer elements for connecting the supporting plates, a prolongation provided on at least one of the spacer elements and including a first portion projecting beyond one of the supporting plates, and a second portion which is deformable so as to form a sleeve engaging a turn of the winding whereby the spacer element forms a voltage tap for the heating element.

4,191,881

FOOD OVEN

David W. Ahlgren, Duluth; David A. Hassell, Coon Rapids, and Elvis S. Zimmer, Blue Hill Township, Mille Lacs County, all of Minn., assignors to Jeno F. Paulucci, Duluth, Minn.

Division of Ser. No. 673,114, Apr. 2, 1976, Pat. No. 4,164,991.
This application Jan. 3, 1978, Ser. No. 866,736
Int. Cl.[2] A47J *37/06*
U.S. Cl. 219—388 **8 Claims**

1. In an electrically powerable rotary food oven for heating a food article and having

a cabinet defining a heatable oven chamber therewithin,

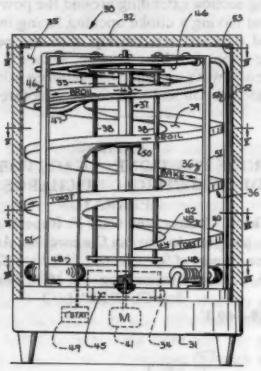
a vertical axis trackway within the oven chamber and having an annular surface for supporting a food article thereon, the annular support surface having a loading end for receiving a food package to be heated and an unloading end for the discharge of a heated food package,

an inlet through the cabinet and into the oven chamber for loading of a food package upon the trackway loading end,

a reel being rotatable about the axis of the trackway and having a drive member engagable with a food article on the trackway for advancing the food article around the trackway from the loading end to the unloading end, and

an outlet through the cabinet and from the oven chamber leading from the unloading end of the trackway for discharge of a heated food article from the oven; the improvement comprising:

(a) a broiling zone inclusive of a first portion of the length of the trackway adjacent to and including the loading end, the broiling zone being that portion of the trackway having a radiant electrical heater element mounted directly atop of the trackway support surface in directly exposed relationship thereto for applying radiant heat downwardly and directly upon the top of a food article being advanced around the trackway for the loading



end immediately after the food article has been placed in the oven;

(b) a toasting zone inclusive of the last portion of the length of the trackway adjacent to and including the unloading end, the toasting zone being that portion of the trackway having an electrical air heater element mounted below and underneath the trackway support surface for convective hot air heating and toasting of the bottom of a food article being advanced on the trackway through the toasting zone and over the air heater element immediately prior to unloading of the food article from the oven; and

(c) a baking zone along a middle portion of the length of the trackway in between and separate from and separating the broiling zone and the toasting zone from one another, the baking zone not having a heating element and not being directly exposed to either of the said heater elements and being heatable by convective flow of air heated by the broiling or toasting electrical heater elements.

4,191,882

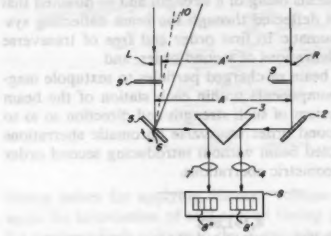
AUTOMATIC FOCUS ADJUSTING DEVICE

Hideharu Sato, Higashikurume, Japan, assignor to Nihon Beru-Haueru Kabushiki Kaisha (Bell & Howell Japan, Ltd.), Higashimurayama, Japan

Filed Jul. 18, 1978, Ser. No. 925,677
Claims priority, application Japan, Jul. 18, 1977, 52-084979
Int. Cl.[2] G03B *3/10*
U.S. Cl. 250—201 **8 Claims**

1. In an automatic focus adjusting system of an electrically

driven and electronically controlled optical apparatus, the focus adjusting system having two optical systems at least one of which has a scanning means, and wherein the focus adjusting system is normally controlled by coincidence of light images from the two optical systems upon pairs of photoelectric elements and an electronic processing system generating timing signals from the position of the scanning means, an automatic focus adjusting device comprising:



a pair of substantially identical light filters, each placed in the light path of one of the optical systems and each having a transparent portion and a light screening portion, the light filters being spaced apart at a selected distance from one another corresponding to a desired pre-focusing distance,

whereby said pre-focusing distance is detected by the adjusting system upon viewing of low contrast object fields.

4,191,883

METHOD FOR DETERMINING RESIDUAL OIL CONCENTRATION OF A FORMATION USING THERMAL NEUTRON DECAY MEASUREMENTS

James C. Albright, and Preston L. Gant, both of Ponca City, Okla., assignors to Conoco, Inc., Ponca City, Okla.

Filed Jun. 1, 1978, Ser. No. 911,626
Int. Cl.[2] G01V *5/00*
U.S. Cl. 250—259 **13 Claims**

1. In the method of determining oil saturation in a subterranean formation penetrated by a well-bore wherein the method comprises:

(a) measuring the thermal neutron decay of a liquid, said liquid having either low or high salinity, in said well-bore and said formation to obtain a first value Σ_A

(b) measuring the thermal neutron decay of a liquid, said liquid having a salinity value opposite of that used in step (a) in said well-bore and said formation to obtain a second value Σ_B and

(c) determining from Σ_A and Σ_B the oil saturation in said reservoir,

the improvement comprising adding to said low salinity liquid a sufficient amount of a material which adjusts the thermal neutron capture cross section of that part of said low salinity material which remains in the borehole so that the thermal neutron capture cross section is approximately the same as the thermal neutron capture cross section of the high salinity liquid.

4,191,884

DETERMINATION OF WATER SATURATION IN SUBSURFACE EARTH FORMATIONS ADJACENT WELL BOREHOLES

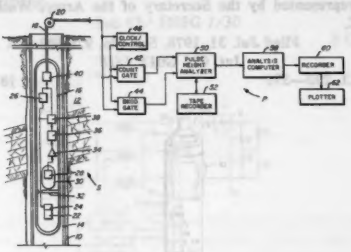
Hubert D. Scott, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Dec. 27, 1977, Ser. No. 865,052
Int. Cl.[2] G01V *5/00*
U.S. Cl. 250—270 **17 Claims**

1. A method of determining the water saturation of an earth formation surrounding a well borehole, comprising the steps of:

(a) bombarding the earth formation with repetitive pulses of fast neutrons which are slowed down and thereafter engage in neutron capture reactions with materials in the vicinity of the bore hole;

(b) obtaining by use of a germanium gamma ray detector gamma ray spectra of the materials in the vicinity of the borehole;



(c) obtaining from the gamma ray spectra a measure of the relative presence of chlorine to that of hydrogen in the formation;

(d) obtaining a measure of apparent formation water salinity from the measure of relative presence of chlorine to hydrogen in the formation; and

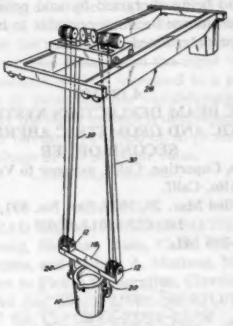
(e) obtaining the water saturation of the formation utilizing the apparent formation water salinity.

4,191,885

METHOD FOR DETERMINING WEIGHT OF MOLTEN METAL IN SITU

Federico A. Rodriguez, Garza Garcia; Jorge Becerra Novoa, San Pedro Garza Garcia, and Julian Sanchez Ramirez, Monterrey, all of Mexico, assignors to Hylsa, S.A., Monterrey, Mexico

Filed Dec. 12, 1978, Ser. No. 968,764
Int. Cl.[2] G09K *3/00*
U.S. Cl. 250—302 **19 Claims**



1. Method for determining the weight of molten metal in a slag-containing molten bath such as occur in an electric furnace or in a teeming ladle comprising determining weight percentage(s) of a given trace element in the molten metal and/or slag if present in a significantly measurable amount, adding to and diluting in said bath a weighed amount of said trace element, effecting good dispersal of said trace element in said bath and then determining the weight percentage(s) of said trace element in said molten metal and/or slag if present in a significantly measurable amount therein, determining the net

weight of said bath if a significantly measurable amount of said trace element is in said slag, and determining from the foregoing known weights and weight percentage(s) the weight of said molten metal.

4,191,886

RADIATION DOSE RATE INDICATOR

Michael J. Basso, West Allenhurst, and Henry B. Brown, Belford, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 31, 1978, Ser. No. 929,623
Int. Cl.[2] G01T 1/18
U.S. Cl. 250—376 **18 Claims**

1. In a pocket size radiation monitor for personal use having an internal power supply for powering a Geiger-Mueller radiation sensing device located within a casing, the improvement comprising:

a user adjustable potentiometer operably coupled to said Geiger-Mueller device so as to have a voltage thereacross proportional to dose rate, said potentiometer having a slider contact which provides a selectively variable output voltage corresponding to a desired radiation dose rate to be monitored or measured;

circuit means coupled to said slider contact and being responsive to said output voltage to become operable at a selected output voltage to effect energization of a light source; and

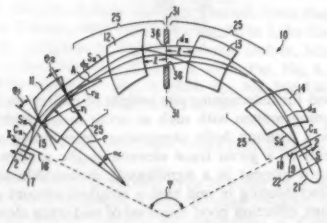
an electrically energized light source coupled to said circuit means and being energized by said power supply when said circuit means becomes operable to indicate the sensing of a predetermined dose rate.

4,191,887

MAGNETIC BEAM DEFLECTION SYSTEM FREE OF CHROMATIC AND GEOMETRIC ABERRATIONS OF SECOND ORDER

Karl L. Brown, Cupertino, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Mar. 29, 1978, Ser. No. 891,432
Int. Cl.[2] H01J 37/00
U.S. Cl. 250—396 ML **6 Claims**



1. In a method for deflecting a beam of non-monoenergetic charged particles through a given bending angle in a beam deflecting system, the steps of:

directing the beam of charged particles serially through four or more magnetic beam deflecting stations:

producing first magnetic field components in each of said magnetic beam deflecting stations for bending the beam of charged particles and for focusing the beam of charged particles in each of two orthogonal directions transverse to the central orbital axis of the beam, said first magnetic field components being of a strength and so directed that the beam, as deflected through the beam deflecting system, is achromatic to first order and free of transverse geometric aberrations of second order; and

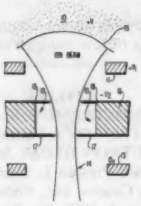
subjecting the beam of charged particles to sextupole magnetic field components within each station of the beam deflecting system of such strength and direction so as to eliminate second order transverse chromatic aberrations of the deflected beam without introducing second order transverse geometric aberrations.

4,191,888

SELF-SHIELDING SMALL HOLE ACCEL GRID

George A. Meadows, Bethesda, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Nov. 17, 1978, Ser. No. 961,828
Int. Cl.[2] G21K 1/08
U.S. Cl. 250—396 R **4 Claims**



1. In an ion extraction system utilizing small hole accel grid optics and comprising within a discharge chamber a neutral highly ionized plasma source at a first voltage V_1, V_1 being positive, a plurality of electrodes downstream of said plasma source each having apertures in axial alignment and including in the following order a screen grid at said first voltage V_1 and an accel grid at a second voltage V_2, V_2 being negative, said accel grid having a relatively small aperture in the range of less than 50% to approximately 10% the size of the aperture of said screen grid, the electric field set up by said screen grid and said accel grid serving to extract an ion beam from the plasma source and focus the ion beam through the accel grid aperture, the improvement wherein said accel grid is provided with a relatively large aperture and a metallic foil on at least the downstream face thereof covering said large aperture, said relatively small aperture being etched in the metallic foil by the ion beam.

4,191,889

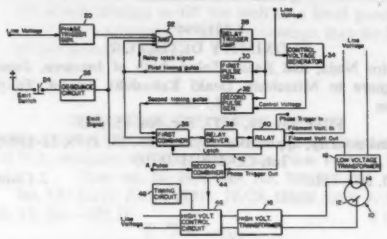
PREHEAT CIRCUIT FOR X-RAY TUBES

David Cowell, Webster, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

Filed Dec. 5, 1977, Ser. No. 857,257
Int. Cl.[2] H05G 1/00
U.S. Cl. 250—402 **2 Claims**

1. A preheat circuit for X-ray tubes requiring filament voltage and high voltage, said circuit consisting of a first pulse generator providing a first timing pulse of fixed duration, a second pulse generator providing a second timing pulse of variable duration less than the duration of said first timing pulse; means for enabling said first and second pulse generators

so that said first timing pulse and said second timing pulse initiate simultaneously; means responsive to line voltage for controlling the length of said second timing pulse in relation to the line voltage; means responsive to said first and second



timing pulses for applying filament voltage to a X-ray tube upon the termination of said second timing pulse; and means for applying high voltage to the X-ray tube after the termination of said first timing pulse.

4,191,890

SYNTHETIC APERTURE SCANNER FOR DECODING A CODED IMAGE PRODUCED BY PENETRATING RADIATION, SUCH AS X-RAYS

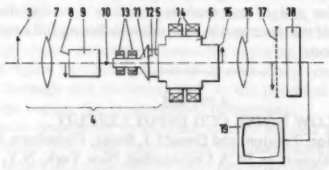
Ronald J. Geluk, Nootdorp, Netherlands, assignor to N.V. Optische Industrie "De Oude Delft", Delft, Netherlands

Filed Nov. 25, 1977, Ser. No. 854,701

Claims priority, application Netherlands, Dec. 3, 1976, 7613502

Int. Cl.² G03B *41/16*

U.S. Cl. 250—402 **8 Claims**



1. Apparatus for decoding a coded image formed by penetrating radiation, such as X-rays, projected from a plurality of sources of radiation which sources are substantially point sources and arranged in a given spatial distribution pattern, the apparatus comprising means for spatially shifting a thus coded image in accordance with the distribution pattern of the radiation sources; integrating means for integrating and generating an electrical signal from the coded image obtained from such shifting means; reproduction means for bringing the electrical signal formed by said integrating and generating means into a form suitable for presentation, said shifting means including an image intensifier with an output screen having a short persistence and associated deflector means for bodily shifting an electron-optical image formed in the image intensifier according to a frame of image lines, and converter means for forming an image derived from the radiation image to be decoded on the input screen of said image intensifier; said integrating and generating means including one or more masks, each having a pattern corresponding to the distribution pattern of the sources of radiation and optically coupled to the output image of said image intensifier, and an image detector disposed behind each mask for integrating all of the image passed by said mask.

4,191,891

X-RAY DIAGNOSTIC GENERATOR IN WHICH THE X-RAY TUBE VOLTAGE IS REGULATED VIA THE X-RAY TUBE CURRENT

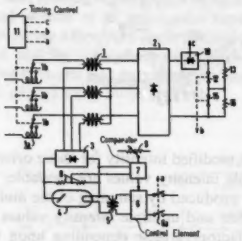
Heribert Amtmann, Buckenhof; Hans Ebersberger; Guenter Eckardt, both of Nuremberg, and Hans-Joachim Greiner, Buckenhof, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 9, 1978, Ser. No. 959,231

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1977, 2757505

Int. Cl.² H05G *1/30*

U.S. Cl. 250—402 **3 Claims**



1. An x-ray diagnostic generator having an x-ray tube circuit for supplying x-ray tube voltage including a high voltage transformer, a regulator circuit for the x-ray tube voltage which contains a comparator element for comparing the actual value of the x-ray tube voltage with a set point value, an x-ray tube heater circuit for supplying x-ray tube filament current, and also a control element, controlled by the output signal of the comparator element for controlling the filament current of the x-ray tube in order to adjust the actual value of the x-ray tube voltage to the set point value, characterized in a variable-ratio transformer (**1***a*) being connected in series with the high voltage transformer (**1**) for the stepwise switching of the input voltage of the high voltage transformer (**1**), the x-ray tube circuit including at least one resistor means (**13, 16**), and switch means (**12, 15**) for connecting the resistor means so as to change the x-ray tube voltage, the heater circuit of the x-ray tube (**4**), the variable-ratio transformer (**1***a*) and the switch means (**12, 15**) being controlled such that firstly the x-ray tube heater circuit is cut off in order to decrease the x-ray tube output, thereafter the resistor means (**13, 16**) is connected to decrease the x-ray tube voltage and the input voltage of the high voltage transformer (**1**) is increased to a predetermined value by means of switching the variable-ratio transformer (**1***a*), subsequently the input voltage is decreased, and then the x-ray tube heater circuit is switched on to provide for control of x-ray tube voltage at the set point value.

4,191,892

SPREAD BEAM OVERLAP METHOD

Sung-Cheng Huang, Sherman Oaks, Calif.; Carl J. Brunnett, Mayfield Heights, and Rodney A. Mattson, Mentor, both of Ohio, assignors to Picker Corporation, Cleveland, Ohio

Filed Jun. 30, 1978, Ser. No. 921,010

Int. Cl.² G01N *21/34, 23/04*

U.S. Cl. 250—445 T **8 Claims**

1. A method for computed tomographic scanning comprising the steps of:

(a) providing an angular spread of electromagnetic radiation that subtends an angle ϕ;

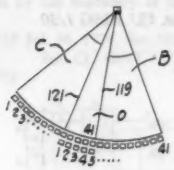
(b) translating said beams relative to a subject while irradiating the subject with the radiation;

(c) measuring the intensity of the beams along various orientations after the radiation has passed through the subject and as it is translated;

(d) rotating the source through an angle less than ϕ, and

reradiating said subject while translating the beams in their rotated orientation; the translation after rotation producing a portion of beam overlap which results in multiple intensity values for similarly oriented beam paths;

(e) performing repeated translations and rotations until the subject has been irradiated by beams variously oriented relative to the subject, said translations and rotations defining the limits of a tomographic scan;



(f) calculating a modified intensity for those orientations for which multiple intensity values are available; said modified intensity produced by summing of the multiple intensity values after said multiple intensity values have been scaled by a factor variable depending upon the size of beam overlap and upon the position of the orientation in the overlap; and,

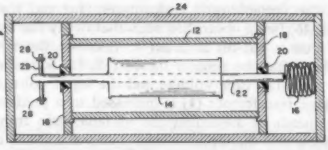
(g) constructing an image of the subject using the modified intensity.

4,191,893

NATURAL TURBULENCE ELECTRICAL POWER GENERATOR

David C. Grana, and Richard T. Wilem, both of Newport News, Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 3, 1978, Ser. No. 883,090
Int. Cl.[2] F03B *13/12*
U.S. Cl. 290—53 **6 Claims**



1. Apparatus for converting the natural turbulence of a fluid, such as water or air, into electrical energy comprising:

a housing mounted such that it is set in motion by said natural turbulence of a fluid;

a stator means mounted in said housing and fixed relative to said housing;

a rotor means;

means for mounting said rotor means in said housing such that the movement of the rotor means is unrestrained longitudinally and rotationally relative to said stator means and such that movement of the rotor means is restrained laterally relative to the stator means with the lateral distance between the rotor means and stator means remaining essentially constant;

a single helical spring with one end of the helical spring attached to said housing and the other end of the helical spring attached to the center of one end of said rotor means and suspending said rotor means whereby the turbulence of said fluid causes a force to be applied parallel to the longitudinal axis of the helical spring resulting in longitudinal and rotational motion of said rotor means relative to said stator means; and

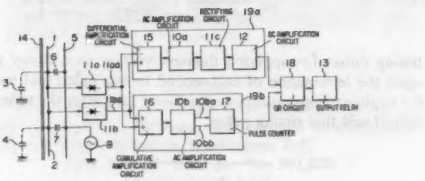
means included with said stator means and said rotor means for converting said rotational motion into electrical energy.

4,191,894

PROXIMITY DETECTOR

Masahiro Noda, and Kazuo Tokui, both of Inazawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 18, 1977, Ser. No. 852,835
Claims priority, application Japan, Nov. 18, 1976, 51-138756
Int. Cl.[2] H01H *36/00*
U.S. Cl. 307—116 **2 Claims**



2. A proximity detector adapted for opening of a door which comprises:

a pair of antennas disposed at the front edge of a door with a space;

means for converting earth electrostatic capacities of the antennas to corresponding voltage;

a first detecting circuit for detecting a differential signal of the outputs of the converting means;

a second detecting circuit for detecting a summing signal of the outputs of the converting means; and

means for responding to the output of the first, or second, detecting circuits for control of the operation of the door,

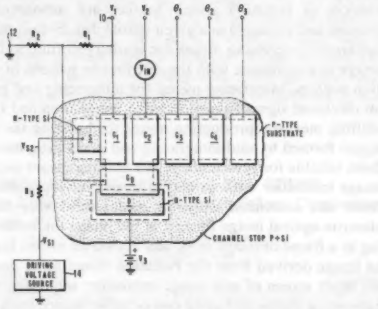
wherein the pair of antennas are used as a bridge during closing of the door and as one antenna during full opening of the door.

4,191,895

LOW NOISE CCD INPUT CIRCUIT

Peter A. Levine, Trenton, and Donald J. Sauer, Plainsboro, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jul. 26, 1976, Ser. No. 708,351
Int. Cl.[2] G11C *19/28*; H01L *29/78*
U.S. Cl. 307—221 D **11 Claims**



1. A method of operating a CCD in which an input potential well initially is filled by introducing charge therein from a source of charge carriers over a potential barrier, and then

some of the charge in the well is spilled out of the well to leave remaining in the well an amount of charge which is a function of a signal potential between the electrode employed to form the barrier and the electrode employed to form the well, comprising the step of:

removing from the well during the filling thereof any carriers which attempt to fill the well to a level greater by more than a substantially fixed percentage, than the height of said potential barrier.

4,191,896

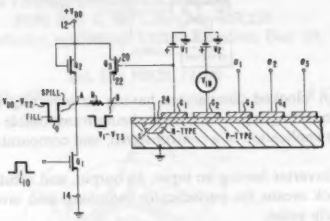
LOW NOISE CCD INPUT CIRCUIT

Donald J. Sauer, Plainsboro, and Peter A. Levine, Trenton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jul. 26, 1976, Ser. No. 708,397

Int. Cl.[2] G11C *19/28*; H01L *29/78*; H03K *5/08, 1/12*

U.S. Cl. 307—221 D **7 Claims**



1. In an input circuit for a CCD which includes a substrate: an input region in the substrate of opposite conductivity than the substrate; a gate region of the substrate adjacent to the input region; a storage region of the substrate adjacent to the gate region; means including electrodes over said gate and storage regions, a signal source coupled between said electrodes, and a bias voltage source connected to said electrode over said gate region, for producing a shallower potential well in said gate region than in said storage region; and means for filling said potential well beneath said electrode over said storage region comprising means for applying a voltage to said input region for causing the same to emit charge carriers which pass through said shallower well to the potential well in said storage region, the improvement comprising:

means responsive to the bias voltage applied to said electrode over said gate region for maintaining said input region at a substantially fixed potential offset greater than zero from said electrode over said gate region during the period said potential well of said storage region is being filled.

4,191,897

SELF-CLOCKING CIRCUIT

Arthur R. Kopp, Lewisberry, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 21, 1978, Ser. No. 898,357

Int. Cl.[2] H03K *5/153*

U.S. Cl. 307—234 **8 Claims**

1. An electronic duty cycle timer circuit for separating clock and data pulses contained in an input pulse train resulting from a two frequency encoded magnetic recording, said pulses being separated by two to on time relationships, said circuit comprising:

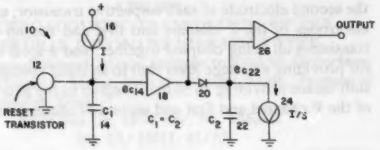
first capacitive means;

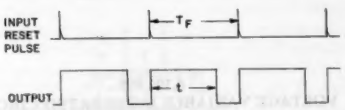
charging current source means electrically connected to said first capacitive means for delivering a constant rate of charging current thereto;

reset pulse discharge means electrically connected to said first capacitive means for delivering a reset pulse thereto to cause said first capacitive means to discharge, said charging current serving to recharge said first capacitive means following said discharge;

second capacitive means electrically connected to said first capacitive means;

unidirectional means electrically interposed between said first and second capacitive means, said unidirectional means permitting current to flow therethrough to said second capacitive means when the voltage potential level of said first capacitive means exceeds the voltage potential level of said second capacitive means, said unidirectional means preventing current to flow therethrough when the voltage potential level of said second capacitive means exceeds the voltage potential level of said first capacitive means, said unidirectional means being conductive during a second portion of an input pulse interval and nonconductive during a first duty cycle portion of said input pulse interval, and the voltage across said unidirectional means changing between said duty cycle portion and said second portion of said input pulse interval;





voltage follower impedance buffer means electrically interposed between said first and second capacitive means for providing charging current to said second capacitive means during said second portion of said input pulse interval, said second capacitive means following said first capacitive means in voltage during said second portion of said input pulse interval;

discharging current source means electrically connected to said second capacitive means for discharging said second capacitive means at a constant rate during said second portion of said input pulse interval, a duty cycle period to input pulse internal ratio being fixed by the selected relative value of said first capacitive means to said second capacitive means, and said charging current source means to said discharging current source means;

current threshold sensing switch means electrically connected to said unidirectional means for electrically sensing said change in voltage levels between said first duty cycle portion and said second portion of said input pulse interval.

4,191,898

HIGH VOLTAGE CMOS CIRCUIT

Richard W. Ulmer, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

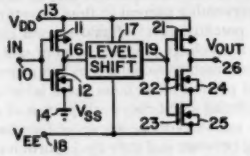
Filed May 1, 1978, Ser. No. 902,012

Int. Cl.[2] H03K *17/60, 17/04, 19/08, 19/20*

U.S. Cl. 307—264 **6 Claims**

1. A CMOS monolithic integrated circuit having high voltage capability, comprising: a P channel field effect transistor having a first electrode, a second electrode and a gate electrode, the first electrode capable of being coupled to a first voltage potential; a first N channel field effect transistor having a first and a second electrode and a gate electrode, the first

electrode of the first N channel transistor being coupled to the second electrode of the P channel transistor and forming an output junction for the circuit; a second N channel field effect transistor having a first and a second electrode and a gate electrode, the first electrode of the second N channel transistor being coupled to the second electrode of the first N channel transistor, the second electrode of the second N channel transistor being capable of being coupled to a second voltage



potential, each of said first and second N channel field effect transistors having a tub and wherein each tub is connected to the second electrode of each respective transistor, and the gate electrodes of the P channel and first and second N channel transistors all being coupled together; and a level shift means for providing a voltage level shift to an input voltage, the level shift means providing an output coupled to the gate electrodes of the P channel and first and second N channel transistors.

4,191,899

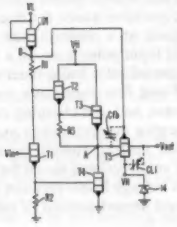
VOLTAGE VARIABLE INTEGRATED CIRCUIT CAPACITOR AND BOOTSTRAP DRIVER CIRCUIT

James J. Tomczak, Burlington, and Richard N. Wilson, Essex Junction, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1977, Ser. No. 811,028

Int. Cl.[2] H03K *19/08, 19/36;* **H01L** *29/92*

U.S. Cl. 307—303 **10 Claims**



1. A voltage variable integrated capacitor comprising:

three p-n junction diodes serially connected between a reference potential and a voltage node, the center one of said p-n junction diodes being oppositely poled with respect to the remaining two of said p-n junction diodes;

input means for coupling an input signal to a point between said p-n junction diode nearest said voltage node and said center p-n junction diode; and

biasing means coupled to said diodes for maintaining all three of said diodes in a reverse biased condition, said p-n junction diode nearest said voltage node providing a capacitively coupled output signal to said voltage node in response to an input signal.

4,191,900

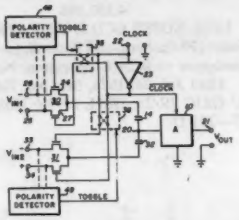
PRECISION PLURAL INPUT VOLTAGE AMPLIFIER AND COMPARATOR

Thomas P. Redfern; Joseph J. Connolly, and Thomas M. Frederiksen, all of San Jose, Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jan. 27, 1978, Ser. No. 872,966

Int. Cl.[2] H03K *5/20, 17/60*

U.S. Cl. 307—355 **9 Claims**



1. A clocked comparator having an inverting input and a non-inverting input, said inputs being transposable in response to the application of a control signal, said comparator comprising:

an inverter having an input, an output, and substantial gain;

clock means for periodically switching said inverter to its trip point;

a pair of switches having common output terminals capacitively coupled to said input of said inverter, and a pair of input terminals coupled respectively to said inverting and non-inverting input terminals of said comparator, said pair of switches being operated in complementary fashion by said clock means; and

electronic means for reversing the sense of said complementary switching in response to the application of said control signal whereby said inverting and non-inverting inputs are transposed without interrupting the signal paths of said comparator.

4,191,901

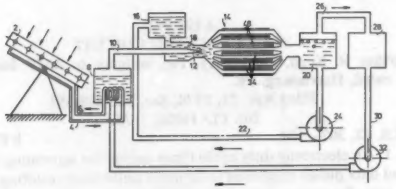
METHOD AND SYSTEM FOR CONVERTING SOLAR ENERGY INTO ELECTRICITY

Herman Branover, Beer-Sheva, Israel, assignor to Ben-Gurion University of the Negev, Beer-Sheva, Israel

Filed Apr. 27, 1977, Ser. No. 791,530

Int. Cl.[2] H02K *45/00*

U.S. Cl. 310—11 **11 Claims**



1. A method for converting solar energy into electricity by means of a magnetohydrodynamic (MHD) generator, comprising the steps of:

(a) providing an organic liquid reservoir having an ejector nozzle positioned at the inlet port of a MHD generator;

(b) providing a liquid alloy reservoir in fluid communication with said inlet port;

(c) providing a solar energy absorber and heating said organic liquid to its boiling temperature by means of the

solar energy absorbed by said absorber so as to form high pressure vapors of the organic liquid;

(d) directing the organic liquid vapors through said liquid alloy so as to form a two-phase mixture of a discontinuous vapor phase and a continuous liquid alloy phase and to propel said mixture through said MHD - generator;

(e) separating the vapors from the two-phase mixture;

(f) condensing said vapors into liquid; and

(g) recycling the organic liquid and the separated alloy liquid to their respective reservoirs, whereby solar heat energy is converted into mechanical energy and said mechanical energy is conterted into electrical energy in said generator.

4,191,902
ROTARY ELECTRIC MACHINES

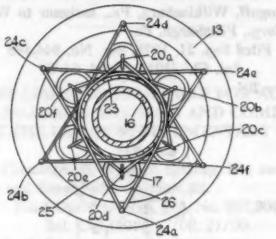
Christopher J. Yarrow, Bradford, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Dec. 9, 1977, Ser. No. 859,128

Claims priority, application United Kingdom, Dec. 11, 1976, 51816/76

Int. Cl.² H02K *11/00*

U.S. Cl. 310—68 D **6 Claims**



1. A rotary electric machine including a shaft, a winding mounted for rotation with said shaft, a stud-mounted diode carried by said shaft for rotation therewith radially inwardly of said winding, a terminal lug of the diode extending substantially parallel to the shaft axis, and an electric connector between said lug and a location on said winding generally diametrically opposite said lug, the arrangement being such that, in use, the centrifugal forces acting on said lug and on a first portion of said connector adjacent thereto on one side of the shaft axis is opposed by the centrifugal force acting on a second portion of said connector on the other side of the shaft axis.

4,191,903
DYNAMOELECTRIC MACHINE WITH AIR GAP ARMATURE WINDING

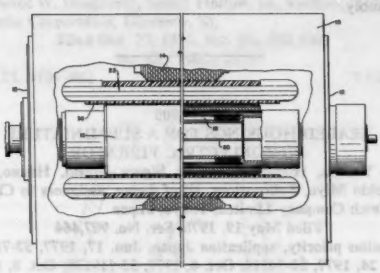
William C. Brenner, Fox Chapel Borough, and Charles C. Sterrett, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 29, 1978, Ser. No. 891,999

Int. Cl.² H02K *3/14*

U.S. Cl. 310—213 **11 Claims**

1. In a dynamoelectric machine having a stator member and a rotor member carrying a field winding, the stator member including a stationary armature winding comprising a plurality of insulated conductors disposed longitudinally of the air gap in a plurality of layers, the conductors of each layer lying side-by-side with adjacent conductors substantially in contact to occupy substantially the entire circumferential extent of the air gap, the conductors having end portions extending beyond the air gap at each end thereof, the end portions of certain of said conductors lying at spaced intervals in each layer being displaced radially out of said layers into a single additional layer, and the end portions of all the conductors being angularly inclined to extend around the stator member for electrical connection to other conductors in spaced positions.



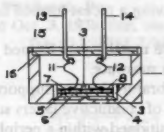
4,191,904
ELECTROACOUSTIC TRANSDUCERS OF THE FLEXURAL RESONANT VIBRATILE TYPE

Frank Massa, Cohasset, Mass., assignor to Fred M. Dellorfano, Jr. and Donald P. Massa, both of Cohasset, Mass., Trustees of The Stoneleigh Trust

Filed Sep. 28, 1978, Ser. No. 946,647

Int. Cl.² H01L *41/10*

U.S. Cl. 310—322 **10 Claims**



1. In combination in an electroacoustic transducer, a flexural vibratile rectangular plate assembly comprising a plurality of bonded plates in which at least one plate has the property of changing its lateral dimensions upon the application of an electrical signal to said plate, a mounting structure, said mounting structure including an opening bounded by a peripheral wall surface, said opening having a shape and size to provide mechanical clearance between said peripheral wall surface and the periphery of said vibratile plate assembly, said mounting structure characterized in that it includes a first plurality of support members projecting from said peripheral wall surface adapted to serve as spacers between the peripheral wall surface of said opening in said mounting structure and the periphery of said vibratile plate assembly, and a second plurality of support members located in a plane at right angles to the peripheral wall surface of said opening, whereby said first and said second plurality of support members serve to precisely locate the position of said vibratile plate, said support members characterized in that the area of contact between said support members and said vibratile plate assembly, when said vibratile plate assembly is placed within said mounting structure, is negligibly small compared with the total area of said vibratile plate, and still further characterized in that said support members are located within said mounting structure in such position that upon placing said vibratile plate assembly within said opening said support members make contact only with the nodal regions of said vibratile plate assembly when said vibratile plate assembly vibrates at its fundamental flexural resonant mode, a resilient rubber-like adhesive between the nodal regions of said vibratile plate assembly and the surfaces of said support mem-

bers whereby the position of said vibratile plate assembly is resiliently fixed relative to the opening in said mounting structure, and electrical conductors connected to said vibratile plate assembly.

4,191,905

SEALED HOUSINGS FOR A SUBMINIATURE PIEZOELECTRIC VIBRATOR

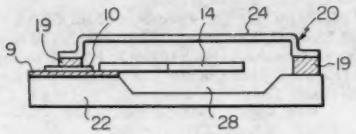
Yuh Yasuda, Higashimurayama; Sigeru Kizaki, Hanno, and Yukio Miya, Tokorozawa, all of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed May 19, 1978, Ser. No. 907,464

Claims priority, application Japan, Jun. 17, 1977, 52-71033; Jun. 24, 1977, 52-74514; Oct. 4, 1977, 52-119138; Oct. 8, 1977, 52-121263

Int. Cl.² H01L *41/10*

U.S. Cl. 310—344 **8 Claims**



1. A subminiature piezoelectric quartz crystal vibrator comprising:

a glass substrate having a recess formed in an upper surface thereof;

a pair of conductive metal layers formed on the upper surface of said glass substrate;

a quartz crystal vibrator element supported on upper surfaces of said pair of conductive layers such that the vibrator element is positioned within a periphery of said recess in said upper surface and separated by fixed distances from surfaces of said recess;

an insulating layer formed upon and partially covering said pair of conductive layers and areas of said upper surface of said glass substrate adjacent to said pair of conductive layer;

a first connecting metallic layer formed upon and partially convering said insulating layer and said upper surface of said glass substrate to form a continuous ring of metallization which surrounds said quartz crystal vibrator element; and

a housing cover sealed to said glass substrate by meas of said first connecting metallic layer.

4,191,906

TUNING FORK TYPE QUARTZ CRYSTAL RESONATOR WITH NOTCHED TINES

Shigeru Kogure, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Suwa, Japan

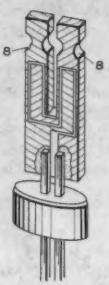
Filed Aug. 25, 1978, Ser. No. 936,941

Claims priority, application Japan, Jan. 26, 1978, 53-7574

Int. Cl.² H01L *41/10*

U.S. Cl. 310—370 **6 Claims**

1. A tuning fork type quartz crystal resonator having the flexure mode of vibration and a mechanically supporting portion disposed below the roots of arms, and comprising the arms of said tuning fork type quartz crystal resonator provided with concave portions in the region of 0.65 through 0.85 from the roots of arms in the case where said roots of arms are 0 and top edges of arms are 1, said concave portions suppressing the



generation of overtone by making the effective length of overtone longer to said supporting portion.

4,191,907

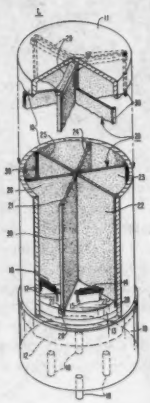
COMPACT SINGLE-ENDED FLUORESCENT LAMP HAVING A PARTITIONED ENVELOPE

Gerald L. Rogoff, Wilkinsburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 21, 1978, Ser. No. 944,495

Int. Cl.² H01J *17/04, 63/04*

U.S. Cl. 313—204 **10 Claims**



1. A low-pressure electric discharge lamp of the single-ended type that is adapted for use as a compact high-intensity light source, said lamp comprising:

a light-transmitting vitreous envelope of tubular configuration that has a substantially flat end wall and is terminated by a closure member which is hermetically sealed to said envelope,

lead-in conductors extending through said closure member in paired relationship,

an electrode connected to and supported by each pair of lead-in conductors and thereby providing a plurality of spaced electrode assemblies at the sealed end of the envelope,

an ionizable medium within said envelope adapted to sustain an electric discharge when the electrodes are energized,

an elongated partition assembly within said envelope extending from the substantially flat end wall thereof toward and beyond the electrodes at the sealed end of the envelope, said partition assembly comprising a plurality of planar

segments that are seated against the envelope end wall and radially extend from a longitudinal axis to the arcuate walls of said envelope and thereby divide the envelope interior into a plurality of sectors which define a tortuous discharge channel that traverses the envelope in retroverted fashion, and

means holding the partition assembly in said position within the envelope comprising a support member of rigid material that extends transversely across the envelope interior and has a series of slot-like channels in its inwardly disposed face which are aligned with and accommodate the end edges of the planar segments of the partition assembly,

each of said slot-like channels containing a layer of compliant material that is in nested relationship with the end edge of the associated planar segment and thereby provides a juncture which cannot be penetrated by the discharge and thus prevents the discharge from bypassing any of the planar segments,

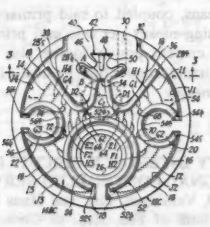
said lead-in conductors extending through said partition-support member and being so arranged that adjacent electrodes are physically isolated from one another by one of the planar segments of the partition assembly which completely spans the space between the partition-support member and the substantially flat end wall of the envelope.

4,191,908

CURRENT LIMITING SPARK GAP FOR ACHIEVING ARC ELONGATION, DIVISION AND COMPRESSION WITHOUT THE USE OF SUPPLEMENTARY MAGNETIC MEANS

Francis V. Cunningham, Western Springs, Ill., assignor to Joslyn Mfg. and Supply Co., Chicago, Ill.

Filed Dec. 11, 1978, Ser. No. 967,906
Int. Cl.² H01J *17/00, 21/00*
U.S. Cl. 313—325 **34 Claims**



1. A spark gap for a high voltage surge arrester comprising a plurality of at least two generally horizontally disposed, contiguous insulating gap plates configured to form a generally horizonally extending arc elongation and cooling chamber therebetween and

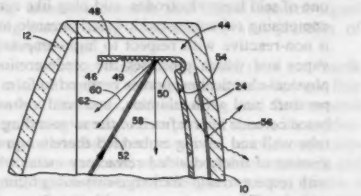
means for forming a series gap within said arc chamber, said series gap forming means comprising first and second, preformed, conductive series gap electrodes and spacing means interfitting with said series gap electrodes for spacing said series gap electrodes apart to define said series gap, said spacing means comprising a gap spacer that is physically separate from, but removably engageable with at least one of said gap plates, said gap spacer including a first, integrally formed extending portion interfitting with said first series gap electrode, a second, integrally formed extending portion interfitting with said second series gap electrode and a third integrally formed bridging portion disposed between and fixedly spacing apart said first and second integrally formed portions of said gap spacer.

4,191,909

COLOR CRT WITH SHADOW MASK HAVING PERIPHERALLY GROOVED SKIRT

Lawrence W. Dougherty, Sleepy Hollow, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Oct. 23, 1978, Ser. No. 953,400
Int. Cl.² H01J *29/07*
U.S. Cl. 313—402 **4 Claims**



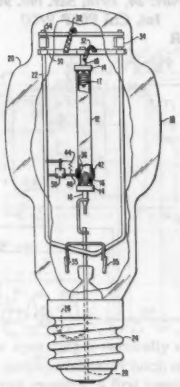
1. In a color cathode ray tube having a screen, an electron gun assembly for generating a plurality of electron beams, and a shadow mask having a dished perforate central portion for selectively transmitting electrons to the screen and a rearwardly extending skirt surrounding said perforate central area, wherein the improvement comprises said shadow mask having on an inner surface of said skirt an array of substantially circumferentially oriented grooves.

4,191,910

STARTING ARRANGEMENT FOR HIGH PRESSURE DISCHARGE SODIUM LAMP

Daniel A. Larson, Cedar Grove, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 3, 1978, Ser. No. 948,131
Int. Cl.² H01J *7/44*
U.S. Cl. 315—51 **11 Claims**



1. In combination with a high-pressure-discharge sodium lamp comprising an elongated alumina arc tube of predetermined dimensions and having longitudinal walls of predetermined thickness, said elongated arc tube sealed at the ends thereof and enclosing a discharge-sustaining filling comprising sodium and inert ionizable starting gas, electrodes operatively positioned within said arc tube proximate the ends thereof, lead-in means extending through the sealed ends of said arc tube and connecting to said electrodes, a light-transmitting protective outer envelope surrounding said arc tube, frame means positioned within said outer envelope and supporting said arc tube in predetermined position within said outer envelope, electrical adaptor means affixed to said outer envelope for connection to a source of power, a pair of electrical con-

nection means connecting said electrical adaptor means to said lead-in means, and one of said electrical connection means including said frame means to electrically connect one of said electrodes to said electrical adaptor means, the improvement which comprises:

a. at least one small plug-like electrically conductive ceramic means of predetermined dimensions extending through the longitudinal wall of said arc tube proximate at least one of said lamp electrodes, said plug-like ceramic means comprising refractory-oxide-based ceramic matrix which is non-reactive with respect to high-temperature sodium vapor and which possesses the predetermined thermal-physical-chemical properties required to form a high-temperature seal with alumina, and said refractory-oxide-based ceramic matrix fused to the surrounding alumina arc tube wall and having embedded therein a predetermined amount of finely divided refractory metal which is inert with respect to said discharge-sustaining filling to provide said plug-like ceramic means with a predetermined electrical conductivity; and

b. during starting of said lamp said plug-like ceramic means electrically connect, exteriorly of said arc tube, to the said electrode which is positioned proximate the opposite end of said arc tube from the connected plug-like ceramic means, and during starting of said lamp the total electrical resistance between the interior surface of said plug-like ceramic means within said arc tube and the connected opposite electrode permitting the maintenance of a glow-type discharge within said arc tube between said interior surface of said plug-like ceramic means and the said electrode which is proximate thereto to ionize the atmosphere within said arc tube.

4,191,911

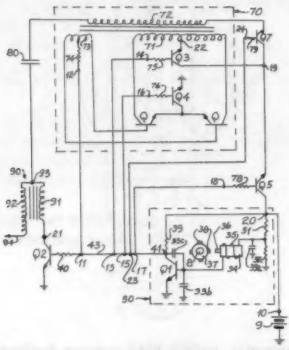
AC POWER GENERATION CONTROL SYSTEM

Martin E. Gerry, 13452 Winthrope St., Santa Ana, Calif. 92705

Filed Nov. 24, 1978, Ser. No. 963,525

Int. Cl.² F02P 9/00

U.S. Cl. 315—209 R **17 Claims**



1. In an alternating current power source having solid state active devices and a transformer having an output winding for feeding an impedance load, comprising the combination of:

a capacitor connected in series with the output winding and the load;

logic means coupled to the transformer for activating said power source during a first mode of its operation and for deactivating said power source during a second mode of its operation; and

control means, coupled to said transformer and triggered by the logic means, for inhibiting energy residual in said transformer from being transferred therefrom during said second mode.

4,191,912

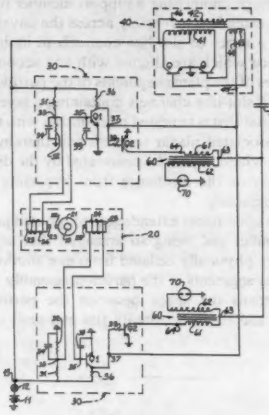
DISTRIBUTORLESS IGNITION SYSTEM

Martin E. Gerry, 13452 Winthrope St., Santa Ana, Calif. 92705

Filed Dec. 14, 1978, Ser. No. 962,754

Int. Cl.² F02P 9/00

U.S. Cl. 315—209 R **19 Claims**



1. A distributorless ignition system comprising the combination of:

a power source having output means for providing alternating current;

a capacitor in series with said output means;

a plural number of primary circuits comprising a plural number of transformer windings connected to said capacitor and output means, said capacitor, output means and one of the transformer windings comprising one primary circuit; and

switching means, coupled to said primary circuits, one of said switching means per one said primary circuit, said alternating current power source also being means for enabling current conduction to take place through said switching means.

4,191,913

SAFETY INTERLOCK CIRCUIT FOR AN ERROR-SIGNAL-CONTROLLED SERVO SYSTEM

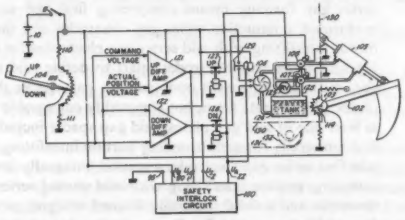
Winfried Arnold, Vaihingen, Enz, and Hans Kubach, Korntal-Munchingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 6, 1977, Ser. No. 857,889

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1976, 2655906

Int. Cl.² G05B 9/02

U.S. Cl. 318—563 **19 Claims**



1. An electronic safety interlock circuit for a servo system

having at least one member arranged to be driven over a range of positions and movement in accordance with a command element having a corresponding range of positions, means for converting actual position of said member into an electrical value, means for converting a commanded position of said member into a corresponding electrical value, a control system for driving said member from its actual position to a commanded position by reference to comparison of said electrical values respectively produced by said converting means and a switch for putting said control system into and out of operation and further having the improvement which consists in that:

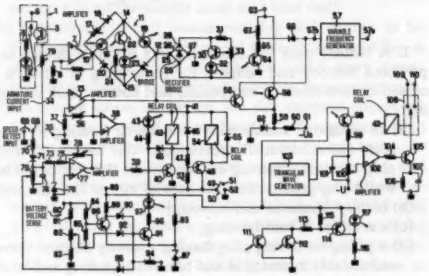
output disabling means are provided for preventing unexpectedly violent movement of said member following operation of said switch to put said system into operation, by holding said member locked in position, and thereby disabling the output effect of said servo system, from the time of operation of said switch for so long as an initial difference exceeding a predetermined small threshold magnitude and beginning substantially at the time of operation of said switch is present between said electrical values respectively produced by said converting means.

4,191,914

CONTROL CIRCUIT FOR A DC ELECTRIC MOTOR PARTICULARLY USED IN THE PROPULSION OF AN ELECTRIC VEHICLE

Jean-François Lecluse, Douvres, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed May 8, 1978, Ser. No. 903,795
Claims priority, application France, May 12, 1977, 77 14573
Int. Cl.² H02P *7/14*
U.S. Cl. 318—139 **12 Claims**



1. An apparatus for controlling a DC motor having an armature coil and a field coil and used for the propulsion and the energy recovery braking of a motor vehicle, said apparatus comprising

an armature current chopper having a signal input and an output connected to said armature coil;

a separate filed current chopper having first and second signal inputs and an output connected to said field coil;

means for providing an armature current control signal;

a plurality of safety devices;

means for providing a control voltage proportional to requested power with a positive value when an acceleration is selected and a negative value when a braking is selected; and,

control means for controlling both said armature current and said field current for obtaining a selected acceleration and braking comprising:

a first controlled means responsive to the output of a first control signal emitting means for providing a control signal to said first signal input of said field current chopper,

a second controlled means responsive to the output of a second control signal emitting means for providing a control signal to said second signal input of said field current chopper,

a third controlled means responsive to the output of a third control signal emitting means for providing a control signal to said signal input of said armature current chopper,

a fourth controlled means responsive to the output of a fourth control signal emitting means for progressively limiting armature current, said fourth control signal emitting means being controlled by said plurality of safety devices; and,

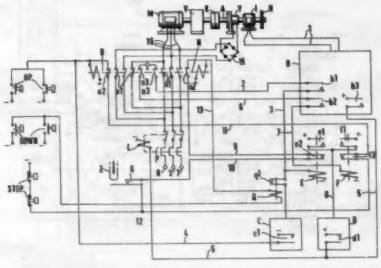
a bridge circuit comprising a first, second, third and fourth terminals, a first outer arm connected between said first and second terminals and including said first control signal emitting means and in parallel therewith an electrical circuit including a resistor, a second outer arm connected between said second and third terminals and including said second control signal emitting means, a third and fourth outer arms respectively connected between said fourth terminal and said first and third terminals, said third and fourth arms each including a diode, an inner diagonal arm connected between said second and fourth terminals and including a serial connection of said third control signal emitting means and said fourth controlled means, said first terminal being connected to the output of said means for providing a control voltage proportional to requested power and said third terminal being connected to the output of said means for providing an armature current control signal.

4,191,915

DOOR OPERATING APPARATUS

Tryggve J. Johansson, Oloupersvagen 23, Älvängen, Sweden (44600)

Filed Sep. 27, 1977, Ser. No. 836,970
Claims priority, application Sweden, Mar. 28, 1977, 7703512
Int. Cl.² H02P *3/00*
U.S. Cl. 318—464 **1 Claim**



1. Apparatus for operating a vertically movable door comprising an electric motor; a friction clutch comprising a driving member and a driven member; a first transmission means connecting the motor with said driving member; said transmission means connecting said driven member with the door; circuit means for connecting the motor to a source of power, said circuit means including a first switch arranged to connect the motor for rotation in the direction causing closing of the door, a second switch aranged to connect the motor for rotation in the direction causing opening of the door, and a third switch connected in series with said first and second switches; a stop member arranged to prevent the door from moving beyond a predetermined fully-open terminal position; automatic means for switching off the motor from the source of power on arrival of the door to said terminal position, said automatic means including means for sensing the rotation of a rotary part of said second transmission means, means arranged to produce a first signal responsive to the sensing by said sensing means of a

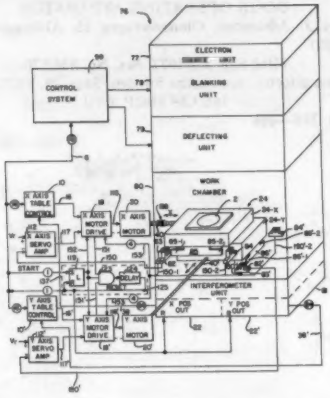
deviation of the rate of rotation downward from a predetermined range, and control means responsive to said first signal for causing said second switch to be restored to its open-circuit condition; means for automatically reversing the motor when the door upon closing encounters an obstruction, said means including means for sensing the state of said first switch and for producing a second signal when sensing the closed state of said first switch, and a gate arranged to be controlled by said first and second signals and to respond to the simultaneous reception of said first and second signals by producing a third signal, control means responsive to said third signal for causing said switch to be restored to its open condition, and delayed control means responsive to said third signal for closing said second switch, and means sensing the state of the motor circuit and for producing, when sensing the closed state of the motor circuit, a signal circuit condition indicative of said closed state, a second and gate arranged to respond to the simultaneous presence of said signal circuit condition and said first signal by producing a fourth signal, a time delay circuit arranged to be controlled by said fourth signal and to cause said third switch to be opened when said fourth signal has lasted a predetermined time.

4,191,916

TABLE POSITIONING SYSTEM INCLUDING OPTICAL REFERENCE POSITION MEASURING TRANSDUCER

John J. Zasio, Sunnyvale, and Michael W. Samuels, San Jose, both of Calif., assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 23, 1977, Ser. No. 854,424
Int. Cl.[2] G05B 1/06
U.S. Cl. 318—640 **18 Claims**



1. A table positioning apparatus including in each of first and second axes,

a movable table,

a motor for driving the table in response to a motor drive signal,

an optical position measuring transducer located to establish a reference position for said table in a local region defined by a light beam, and operative to provide a reference position signal as a function of the table position relative to said reference position in the local region, said position signal having a reference value when the table is at the reference position,

an amplifier responsive to said reference position signal to produce a servo signal having a positive sign when said position signal is less than said reference value, having a zero value when said position signal is equal to said reference value, and having a negative sign when said position signal is greater than said reference value,

a motor drive for providing said motor drive signal in response to said servo signal whereby said table is driven to said reference position and causes said servo signal to have said zero value to indicate that said table is at said reference position,

a zero detector for detecting said zero value to provide a servo zero signal,

an interferometer for measuring the position of said table over a table travel greater than and including said local region, said measurement unit including a digital counter for storing a count representing the position of the table as measured by said measurement unit,

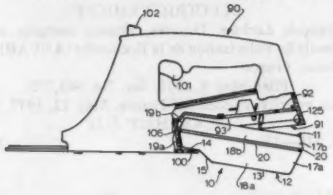
means for connecting said servo zero signal to reset said counter to establish said count to indicate said reference position.

4,191,917

BATTERY PACK RECHARGEABLE IN RECESSED OR FLUSH-TYPE RECEPTACLES

Wayne R. Brown; John E. Jones, and Charles F. Sherrill, all of Danville, Va., assignors to Disston, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 827,694, Aug. 25, 1977, abandoned. This application Feb. 10, 1978, Ser. No. 876,934
Int. Cl.[2] H02J 7/00
U.S. Cl. 320—2 **8 Claims**



1. A battery pack for mounting in a portable device to be powered thereby and adapted for recharging in either a recessed or non-recessed receptacle, said battery pack comprising:

(a) an elongated substantially rectangular housing having at least one substantially rectangular flat base wall with a plug receiving opening and said walls, the area of the base wall being greater than the area of any of the side walls;

(b) battery means in said housing;

(c) a rectifier in said housing;

(d) a prong-mounting plug having a cavity formed therein and slidably mounted in said base wall opening and having a pair of external contact prongs fixed on and extending therefrom and oriented perpendicular to said base wall, said slidable plug being positionable in at least one outwardly extending position from said base wall wherein said plug and prongs are both extended and adapted for insertion into a recessed receptacle for recharging said pack and positionable to a retracted position wherein said plug retracts into said housing inwardly of the plane of said base wall and said prongs extend outwardly from said base wall for insertion into a non-recessed receptacle or into a device having mating prong recesses for recharging said pack or powering said device as the case may be;

(e) circuit means including cooperative sliding contact means including on one side sliding contacts fixed on and movable with said plug and on the other side contacts engaged by said sliding contacts within the housing and being effective to connect said prongs to said battery means through said rectifier in any of said plug positions enabling said battery means to be recharged from either said type receptacle;

(f) switching means having on one side contacts fixed within said housing and connected to said battery means and having on the other side contacts fixed within said plug cavity and connected to said prongs and slidable connect-

ing and actuator means mounted within said plug cavity and movable relative to said plug for bridging said fixed housing and plug cavity contacts and spring-biased by means within said plug cavity to maintain said fixed housing and plug cavity contacts disconnected when the pack is not mounted in the device and adapted to being actuated by means on the device operative on said actuator means to connect the battery means through said fixed housing and plug cavity contacts and connecting means to discharge through the external contact prongs upon mounting the pack in said device and with said plug in said retracted position; and

(g) releasable latching means mounted on said base wall and cooperative with said plug enabling said plug to be releasably secured in any of said positions.

8. A battery pack adapted for being mounted in a portable device to be powered thereby and for being recharged in either a recessed or non-recessed receptacle, said battery pack comprising:

(a) an elongated housing having at least one substantially rectangular flat base wall and side walls;

(b) battery means in said housing;

(c) a rectifier in said housing;

(d) a prong-mounting plug having a cavity formed therein and slidably mounted in said base wall and having a pair of external contact prongs fixed on and extending therefrom and oriented perpendicular to said base wall, said slidable plug being positionable in at least one outwardly extending position from said base wall wherein said plug and prongs are both extended and are adapted for insertion into a recessed receptacle for recharging said pack and in a retracted position wherein said plug retracts into said housing inwardly of the plane of said base wall and said prongs extend outwardly from said base wall;

(e) positionable circuit means enabling said prongs to be connected to said battery means through said rectifier in any of said plug positions such that said battery means may be recharged from either said type receptacle; and

(f) switching means having on one side contacts connected to said battery means and on the other side contacts within said plug cavity and connected to said prongs and positionable means within said plug cavity for bridging said contacts and operative to maintain said contacts disconnected when the pack is not mounted in the device and adapted when the pack is mounted in the device to being actuated by means on the device to connect said contacts within said plug cavity enabling said battery means to discharge through the prongs and with the plug in the retracted position.

4,191,918

AUTOMATIC ELECTRIC BATTERY CHARGING APPARATUS

Anthony T. Nicholls, Eccles, England, assignor to Chloride Group Limited, London, England

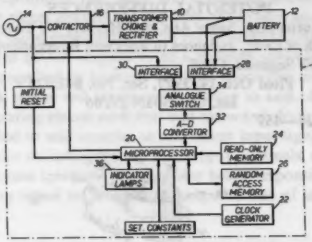
Filed Oct. 5, 1977, Ser. No. 839,451

Claims priority, application United Kingdom, Aug. 24, 1977, 35493/77

Int. Cl.[2] H02J 7/04

U.S. Cl. 320—23 **19 Claims**

1. Automatic electric battery charging apparatus, comprising means arranged to provide a control signal which follows variations in battery voltage comparatively rapidly, and a delayed signal which follows variations in battery voltage comparatively slowly, and means arranged to monitor the control and delayed signals and to reduce the average charging current when the difference between the control and delayed



signals, or a signal which follows this difference comparatively rapidly, falls below a predetermined value.

4,191,919

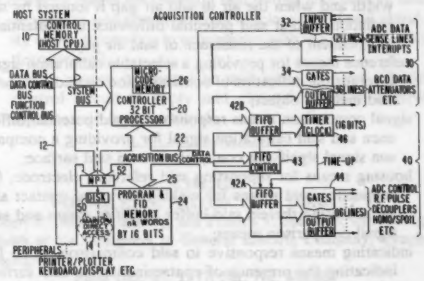
FAST NMR ACQUISITION PROCESSOR

Richard M. Haney; Robert A. Stillman, both of Palo Alto, and Robert S. Codrington, Los Altos Hills, all of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed May 22, 1978, Ser. No. 907,650

Int. Cl.[2] G01R 33/08

U.S. Cl. 324—312 **10 Claims**



1. In an impulse NMR spectrometer comprising a digital processor to generate gating commands for excitation of resonance and control data acquisition functions of said spectrometer, the improvement comprising:

a FIFO register for containing a sequence of gating state words, each said word having a first portion for selecting the status of gates responsive to said gating commands and a second portion specifying the time interval for the persistance of said gating state word, said sequence of gating state words supplied by said digital processor,

output latch means for asserting said gating commands responsive to the first portion of the currently asserted gating state word of said FIFO register, and

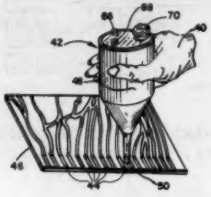
timing means responsive to said second portion of said gating state word for advancing the next sequential gating state word to said output means at the expiration of the persistence inteval of the currently asserted gating state word.

4,191,920

INSTRUMENT FOR DETECTING CONTAMINATION ON METALLIC SURFACES BY MEASURING SURFACE POTENTIAL DIFFERENCES

Jack D. Guttenplan, Santa Ana, and Herbert W. Yancey, Downey, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 14, 1977, Ser. No. 842,022
Int. Cl.[2] G01N *27/66*
U.S. Cl. 324—459 **6 Claims**



1. An instrument for sensing surface potential difference, comprising:

reference electrode means adapted for disposal adjacent to a surface of a metallic object whereby an air gap between said electrode and said surface is defined;

radioactive means for directing radiation into said air gap wherein said radioactive means is disposed within said electrode so as to ionize the air in said air gap;

means for making electrical contact directly with said metallic object;

buffer amplifier means for sensing and amplifying a potential difference between said reference electrode means and said means for making electrical contact;

said buffer amplifier means having an input circuit impedance sufficiently greater than the resistance of said air gap when said air gap is within predetermined limits of width and when the air in said air gap is ionized by said radiation so that said potential difference is substantially independent of the resistance of said air gap;

reference means for providing a selectable calibration signal level for the indication of contamination on said surface of said metallic object;

signal comparison means responsive to said potential difference and said calibration signal for providing a comparison signal signifying contamination on said surface;

housing means for supporting said reference electrode, for supporting said means for making electrical contact and for enclosing therein said buffer amplifier means and said signal comparison means;

indicating means responsive to said comparison signal for indicating the presence of contamination on said surface wherein said indicating means is so mounted on said housing means as to be viewable by a human operator; and

wherein said instrument is formed as a portable probe suitable for hand-held use by said human operator.

4,191,921

CORONA DISCHARGE DETECTION APPARATUS WHICH ELIMINATES PERIODIC NOISE

Hironori Yoshino, Takarazuka, Japan, assignor to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Filed Oct. 28, 1977, Ser. No. 846,397
Claims priority, application Japan, Oct. 30, 1976, 51-130610; Nov. 30, 1976, 51-144138
Int. Cl.[2] G01R *31/14*; H04B *15/00*
U.S. Cl. 324—54 **11 Claims**

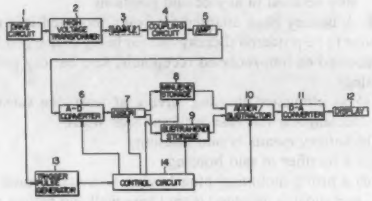
1. A corona discharge detection apparatus comprising:

an A–D converter for converting a corona signal including a noise component which is in synchronism with a frequency of a power supply voltage into a predetermined number of digital signals for each cycle of said power supply voltage;

a first storage device coupled to said A–D converter for successively storing said predetermined number of digital signals for one cycle of said power supply voltage;

a second storage device coupled to said A–D converter for successively storing said predetermined number of digital signals for a different cycle of said power supply voltage;

an arithmetic operation device coupled to said first and second storage devices for successively subtracting in the order of storage each of the predetermined number of digital signals stored in said first storage device from a corresponding one of the predetermined number of digital



signals stored in said second storage device to produce a signal indicative of a detected corona discharge which is substantially free from periodic noise synchronized with the frequency of said power supply voltage;

means for providing a trigger signal synchronized with a predetermined phase of said power supply voltage; and,

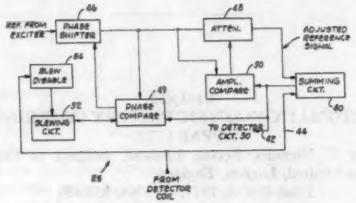
a control means responsive to said trigger signal for providing timed output control signals for controlling the synchronized operation of said A–D converter, first and second storage devices and arithmetic operation device to produce the successive storage and subtraction of the digital signals from the different cycles of the power supply voltage.

4,191,922

ELECTROMAGNETIC FLAW DETECTION SYSTEM AND METHOD INCORPORATING IMPROVED AUTOMATIC COIL ERROR SIGNAL COMPENSATION

Richard M. Harris, Mentor, and Wilbert J. Janos, North Ridgeville, both of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Filed Mar. 14, 1978, Ser. No. 886,392
Int. Cl.[2] G01R *33/12*
U.S. Cl. 324—225 **15 Claims**



1. An electromagnetic flaw detection system comprising:

(a) circuitry for exciting an electromagnetic field;

(b) circuitry including a coil in the region of the field and susceptible of producing an error signal when in the field, said error signal having a phase angle with respect to a reference;

(c) apparatus for moving a metallic workpiece in the field

relative to the coil, for causing the coil to produce an output in response to the passage of a flawed workpiece;

(d) circuitry coupled to the coil for detecting the coil output, and

(e) balancing circuitry responsive to the error signal including circuitry for automatically nulling error signals having a phase angle ranging over 360° with respect to the exciting field.

4,191,923

SATELLITE COMMUNICATION SYSTEMS

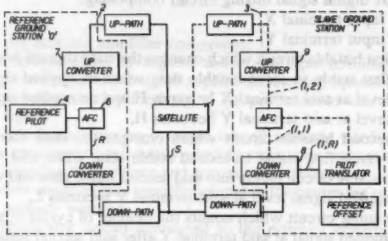
Ernst F. Schelisch, Hatfield Peverel, England, assignor to The Marconi Company Limited, Chelmsford, England

Filed Jun. 1, 1977, Ser. No. 802,508

Claims priority, application United Kingdom, Jul. 30, 1976, 31897/76

Int. Cl.² H04B 7/14

U.S. Cl. 325—4 **7 Claims**



1. A satellite communications system including two or more ground stations arranged to communicate via a satellite, one ground station including means for generating and transmitting a reference pilot signal having a stable reference frequency which is received via the satellite by another ground station, means located at said another ground station for transmitting in a part of the communication band of the system not being used as a communication channel an auxiliary pilot frequency which is received and returned by the satellite to enable Doppler frequency shifts to be detected, and means for generating and transmitting in a designated communication channel reserved for pilots a pilot frequency compensated for the detected Doppler frequency shift so that upon reception at the satellite the pilot frequency is spaced apart in frequency from the reference frequency by a predetermined amount.

4,191,924

CHANNEL SELECTION APPARATUS

Masahiro Takeshita; Kazumi Kawashima; Minoru Ueda, all of Takatsuki, and Keisuke Yamamoto, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 22, 1978, Ser. No. 908,539

Claims priority, application Japan, May 25, 1977, 52/61515; Jun. 15, 1977, 52/71294; Jun. 17, 1977, 52/72435

Int. Cl.² H04B 1/16

U.S. Cl. 325—465 **18 Claims**

1. A channel selection apparatus comprising:

a tuner having a voltage dependent variable reactance element as a tuning element;

a plurality of potentiometers for presetting channel selection voltages one for each of a plurality of channels, said channel selection voltages being selectively applied to said variable reactance element of said tuner for selecting a disired channel;

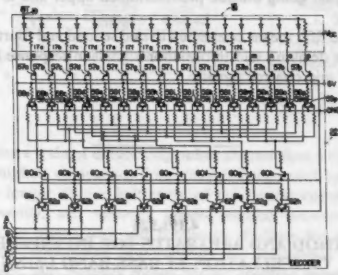
a coupling means for coupling selected one of said potentiometers to said turner such that one of said channel selection voltages taken from said selected potentiometer is applied to said variable reactance element of said tuner;

a counter including a plurality of flip-flops and connecting means for cascade-connecting said plurality of flip-flops such that a trailing edge of an AND output of an output of the flip-flop in one stage and a channel selection count input signal triggers the flip-flop of the next stage;

a clock pulse generating circuit for generating clock pulses;

a control circuit responsive to a channel selection control input applied to an input terminal thereof to extract said clock pulses and couple said counter to said clock pulse generating circuit such that said extracted clock pulses are applied to said counter as said count input signal;

a decoder including binary signal input terminals, a plurality of output terminals said decoder being responsive to said binary signal to produce an output at one of said output



terminals, a plurality of output transistors connected to said plurality of output terminals, respectively, a plurality of parallel-connected transistor sets, means for coupling the bases of said output transistors to the common collectors of the respective ones of said transistor sets, and means for coupling said binary signal input terminals to the bases of the respective ones of said transistor sets;

a coupling means for coupling said output terminals of said decoder to said potentiometers to select one of said plurality of potentiometers in accordance with the output of said decoder; and

a switch means connected to said input terminal of said control circuit to apply said channel selection control input to said input terminal.

4,191,925

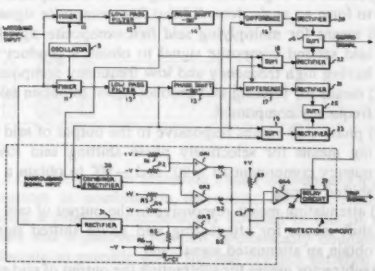
POWER LINE PROTECTION CIRCUIT

Robert P. Dixon, Rustburg, and Francis T. Shannon, Lynchburg, both of Va., assignors to General Electric Company, Lynchburg, Va.

Filed Oct. 27, 1977, Ser. No. 845,887

Int. Cl.² H04B 1/16

U.S. Cl. 325—474 **8 Claims**



1. In a signal receiver for receiving relatively narrowband information signals in a relatively broad band of signals and

producing said information signals at an output, an improved circuit comprising:

a. first means for producing a first signal whose amplitude is indicative of the amplitude of said relatively broad band signals;

b. second means connected to said first means for producing a control signal in response to the amplitude of said first signal rapidly exceeding a dynamic reference level determinated by said relatively broad band signals;

c. third means for producing a second signal whose amplitude is indicative of the aplitude of said relatively narrow-band signals;

d. fourth means connected to said third means for producing a control signal in response to the amplitude of said second signal going outside predetermined upper and lower limits;

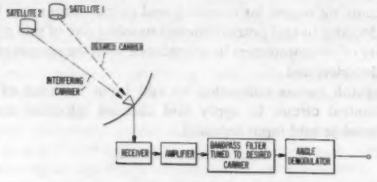
e. and fifth means connected to said second and fourth means for delaying said information signals in response to either of said control signals.

4,191,926

METHOD AND APPARATUS FOR INTERFERENCE CANCELLATION AT BASE-BAND USING MULTIPLICATION OF THE DESIRED INTERFERING CARRIERS

Benjamin A. Pontano, Gaithersburg, and NandKishore M. Chitre, Rockville, both of Md., assignors to Communications Satellite Corporation, Washington, D.C.

Filed Sep. 16, 1977, Ser. No. 834,027
Int. Cl.[2] H04B *1/10*
U.S. Cl. 325—476 **7 Claims**



5. Apparatus for cancelling at baseband frequencies interference components in a first composite signal using a second composite signal, said first composite signal having a desired carrier with a constant envelope and being angle modulated with baseband $\phi_1(t)$ and a modulated interfering carrier, said second composite signal including said modulated interfering carrier, said apparatus comprising:

(a) means for angle demodulating said first composite signal to form an angle demodulated first composite signal,

(b) means for multiplying said first composite signal with said second composite signal to obtain a product signal having high frequency and low frequency components,

(c) means for filtering said product signal to obtain said low frequency component,

(d) phase shift means responsive to the output of said filtering means for selectively phase shifting said low frequency component to $+90°$ and $-90°$ to obtain a phase shifted signal,

(e) attenuating means responsive to the output of said phase shift means for attenuating said phase shifted signal to obtain an attenuated signal, and

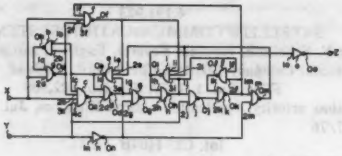
(f) subtractor means for subtracting the output of said attenuating means from the output of said angle demodulating means.

4,191,927

MIXING CIRCUIT FOR DIGITAL SIGNALS

Hiroshi Minakuchi, Takashima, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jan. 30, 1978, Ser. No. 873,496
Claims priority, application Japan, Feb. 8, 1977, 52-13237
Int. Cl.[2] H03K *1/18, 5/20*
U.S. Cl. 328—157 **20 Claims**



1. A digital signal mixing circuit comprising:

an input terminal X,

an input terminal Y,

a first bistable circuit which changes the state thereof from a first stable to second stable state when an applied signal level at said terminal X becomes H and an applied signal level at said terminal Y becomes H,

a second bistable circuit which changes the state thereof from a first stable to second stable state when said first bistable circuit enters into said second stable state and said applied signal level at said terminal Y becomes L,

a counter circuit which counts the number of cycles of said applied signal at said terminal Y after said second bistable circuit enters into said second stable state, and

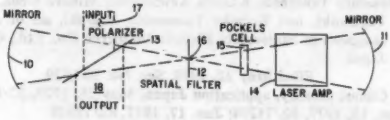
a reset circuit which resets both states of said first and second bistable circuits to said first stable state when an output signal of said counter circuit reaches a target value.

4,191,928

LASER SYSTEM USING REGENERATIVE AMPLIFIER

John L. Emmett, Pleasanton, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 11, 1978, Ser. No. 868,644
Int. Cl.[2] H01S *3/05, 3/23*
U.S. Cl. 330—4.3 **32 Claims**



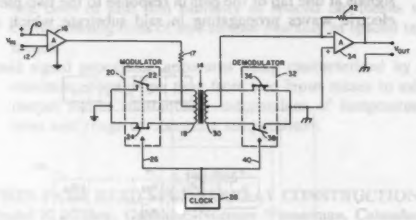
1. An injection laser system utilizing a regenerative amplifier comprising: at least two separated reflector members having a cross-sectional distance of 0.2 to 10.0 meters and defining a resonator cavity having a beam waist therein; at least one spatial filter assembly means for removing phase and amplitude distortion from a high energy laser beam positioned in said cavity at substantially the beam waist of said resonator cavity; at least one amplifier means positioned intermediate a reflector member and at least one said spatial filter assembly; means for injecting at least one laser pulse into said cavity for amplification thereof by multiple passes through said cavity until maximum surface flux density is in excess of 4.5 joules/cm^2; and means for extracting the amplified laser pulse from the cavity.

4,191,929

ISOLATION AMPLIFIER WITH HIGH LINEARITY

Solomon M. Max, Brookline, and Hans J. Weedon, Salem, both of Mass., assignors to Analogic Corporation, Wakefield, Mass.

Filed Jun. 5, 1978, Ser. No. 912,730
Int. Cl.² H03F 3/38
U.S. Cl. 330—10 5 Claims



1. An isolation amplifier comprising:

an input amplifier having first and second input terminals for receiving an input signal applied thereto and operative to provide an amplified signal proportional to the input signal;

a transformer having a center tapped primary winding, a center tapped secondary winding and a core magnetically coupling the primary and secondary windings;

means coupling said amplified signal to the center tap of said primary winding;

a modulator circuit connected to the primary winding for alternately applying the amplified signal to opposite sections of the primary winding;

a differential output amplifier having an inverting input terminal coupled to the center tap of the secondary winding and a non-inverting input terminal coupled to a common return point;

a negative feedback path from the output to the inverting input of the output amplifier providing a current through the secondary winding which tends to force the net flux through the transformer core to zero;

a demodulator circuit connected to the secondary winding for alternately connecting each end of the secondary winding to the commn return point to demodulate the output signal from the center tap of the secondary winding;

the output amplifier providing an output signal representative of the input signal and electrically isolated from the input terminals; and

clock means coupled to said modulator and demodulator and operative to control the operation thereof.

4,191,930

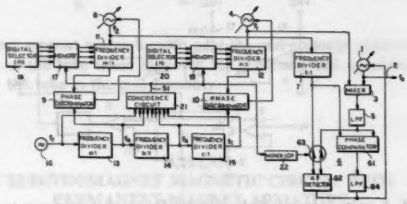
DIGITALLY SETTABLE FREQUENCY GENERATOR

Peter Harzer, Eningen, Fed. Rep. of Germany, assignor to Wandel u. Goltermann GmbH & Co., Eningen, Fed. Rep. of Germany

Filed Sep. 13, 1978, Ser. No. 941,955
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1977, 2741351
Int. Cl.² H03B 3/06
U.S. Cl. 331—1 A 10 Claims

1. In a digitally settable frequency generator comprising selector means and a group of electronically adjustable oscillators including a final oscillator producing an output frequency and a plurality of pilot oscillators producing denominational frequencies jointly determining the magnitude of said output frequency, each of said pilot oscillators being provided with a phase-locking loop including a frequency divider with a step-down ratio digitally variable by said selector means and an associated phase discriminator with a first input connected to receive a variable frequency from said frequency divider and with a second input connected to receive one of a plurality of fixed comparison frequencies, said final oscillator being provided with control means connected between a frequency-adjusting input thereof and said pilot oscillators,

the combination therewith of a reference-frequency source with output connection to the second inputs of the phase discriminators associated with said pilot oscillators for supplying same with coherent frequencies of different magnitudes constituting said comparison frequencies, pulse-generating means connected to said source for producing a train of unblocking pulses shorter than a cycle of the highest comparison frequency and separated by intervals longer than a half-cycle of the lowest comparison frequency, and memory means inserted between said selector means and said frequency dividers for storing setting commands determining the step-down ratios thereof, said memory means having enabling inputs connected to said pulse-generating means for preventing a change in the stored setting commands except in the presence of an unblocking pulse.

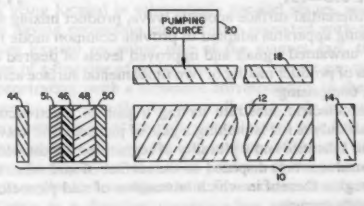


4,191,931

COOLED LASER Q-SWITCH

John D. Kuppenheimer, Tewksbury, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Feb. 6, 1978, Ser. No. 875,469
Int. Cl.² H01S 3/113
U.S. Cl. 331—94.5 Q 13 Claims

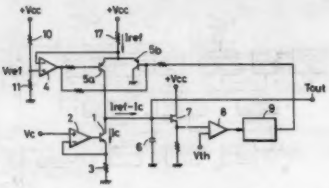


1. In a Q-switched laser including a laser medium and a pair of resonators in combination therewith, the improvement comprising a substrate mechanically coupled to one of said resonators and a passive Q-switch mechanically coupled to said substrate to provide good thermal contact between the Q-switch and substrate such that said substrate acts as a heat sink for such Q-switch.

4,191,932
VOLTAGE-CONTROLLED OSCILLATOR

Yasuo Nagahama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Continuation of Ser. No. 758,293, Jan. 10, 1977, abandoned. This application May 19, 1978, Ser. No. 907,642
Claims priority, application Japan, Jan. 16, 1976, 51-4116; Sep. 16, 1976, 51-111160; Sep. 17, 1976, 51-111596
Int. Cl.[2] G10H *1/04, 5/12;* H03K *4/50*
U.S. Cl. 331—111 5 Claims



1. A voltage-controlled oscillator for producing a saw-tooth output having an oscillator frequency proportional to an input control voltage, said oscillator comprising:

(a) a capacitor, across which said output is produced;

(b) first means for charging said capacitor with a first constant current;

(c) second means for discharging said capacitor with a second constant current, one of said first and second constant currents being proportional to said input control voltage, the other constant current being a difference current produced by subtracting said one constant current from a separate reference constant current independent of said input control voltage; and

(d) third means, including a timing circuit, alternately rendering said one constant current and said other constant current effective upon said capacitor for respective first and second time periods, said second time period starting when the voltage across said capacitor has reached a predetermined value and ending upon the lapse of a predetermined time length controlled by said timing circuit, said first time period starting at the ending of said second time period and ending at the starting of said second time period.

4,191,933
DIFFERENTIAL MIXING SURFACE ACOUSTIC WAVE SIGNAL PROCESSOR

Gary K. Montress; Thomas W. Grudkowski, both of Glastonbury, Conn., and Thomas M. Reeder, Portland, Oreg., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 7, 1978, Ser. No. 967,322
Int. Cl.[2] H03H *9/26, 9/30;* G06G *7/19;* H03C *1/46*
U.S. Cl. 333—151 2 Claims

1. Differential surface acoustic wave, product mixing signal processing apparatus adapted to provide common mode rejection of unwanted signals and improved levels of desired components of product mixing of two fundamental surface acoustic waves, comprising:

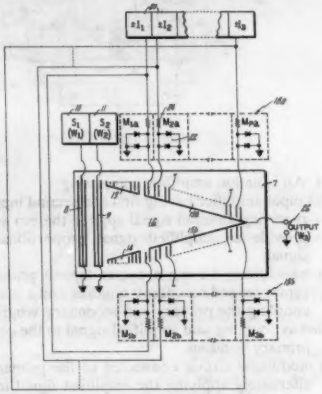
a piezoelectric substrate having a pair of electroacoustic transducers for launching a pair of piezoelectric waves in said substrate and a plurality of segmented acoustoelectric transducer taps disposed on the surface of said substrate in a region thereof in which interaction of said piezoelectric waves occurs;

a pair of wave sources connected to said launching transducers for controlling electroacoustic launching of a pair of piezoelectric waves in the substrate; and

means connected to each one of said taps for providing in conjunction with each tap components of nonlinear product mixing of piezoelectric waves propagating at the surface of said substrate adjacent to the related tap;

in which the improvement comprises:

each of said taps being arranged with another in a pair, both taps in each pair having a phase center displaced along the surface of said substrate a distance from one of said launching transducers which is the same as that of the other tap in the pair, both taps in each pair having the same design center frequency, the segments of the taps in each pair being arranged with respect to the phase center of the pair so as to acoustoelectrically reproduce electric signals at one tap of the pair in response to the two piezoelectric waves propagating in said substrate which are



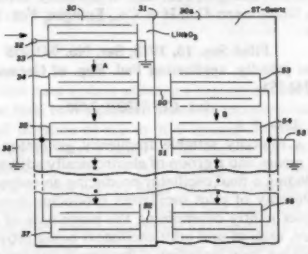
inverted in phase with respect to electric signals acoustoelectrically reproduced at the other one of said taps in the pair in response to the two piezoelectric signals propagating in said substrate; and

means associated with each pair of taps for summing the components of nonlinear product mixing provided by both taps in said pair in conjunction with said means, whereby the electric signals reproduced from the two piezoelectric waves propagating in said substrate at one pair of taps are cancelled, while the desired components of nonlinear product mixing for said pair of taps are added.

4,191,934
HIGH EFFICIENCY WIDE BAND SURFACE ACOUSTIC WAVE COUPLER PROCESSORS

Leland P. Solie, Acton, Mass., assignor to Sperry Corporation, New York, N.Y.

Filed Dec. 11, 1978, Ser. No. 968,242
Int. Cl.[2] H03H *9/26, 9/30, 9/32;* H01L *41/10*
U.S. Cl. 333—155 7 Claims



1. Signal processing apparatus comprising:

first transmission line means having input means and a first

plurality of tap means and characterized by a propagation velocity therethrough significantly dependent upon temperature over a range of operating temperatures,

second transmission line means having output means and a second plurality of spaced tap means and characterized by a propagation velocity therethrough substantially independent of temperature over said range of operating temperatures, and

a pluraity of electrical conductor means for coupling respective ones of said first plurality of spaced tap means to corresponding ones of said second plurality of spaced tap means,

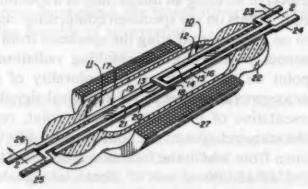
said signal processing apparatus being characterized by a resultant propagation time from said input means to said output means substantially independent of temperature over said range of operating temperatures.

4,191,935

TWIN PATH REED SPRING RELAY CONSTRUCTION

Wendel E. Archer, Gahanna; Norman Wasserman, Columbus, both of Ohio, and Douglas H. Yano, Naperville, Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 10, 1978, Ser. No. 876,613
Int. Cl.[2] H01H *1/66, 51/27*
U.S. Cl. 335—154 **11 Claims**



1. An electrical relay construction comprising a first and a second electrically conductive, magnetically responsive contacting mechanism, each comprising a yoke means having a pair of substantially parallel legs having a contact means therebetween at one end, each of said yoke means being suspended at the other ends of said legs to maintain the contact means of one yoke means in a spaced-apart and overlapping relation with the contact means of the other yoke means, and a first and second reed spring member positioned between the legs of the yoke means of each of said mechanisms, respectively, said reed spring members being also of a magnetically responsive, electrically conductive material, each of said reed spring members being suspended at one end at the other ends of said legs to maintain the other end of the reed spring member of each of said mechanisms in a spaced-apart and overlapping relation with the contact means of the other of said mechanisms.

4,191,936

IMAGE PICKUP ASSEMBLY

John J. Colgan, Jr., Haddon Heights, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 21, 1978, Ser. No. 944,338
Int. Cl.[2] H01F *7/00*
U.S. Cl. 335—210 **5 Claims**

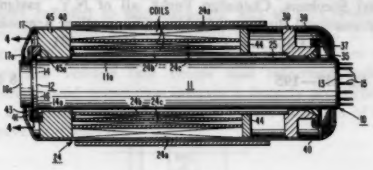
1. An image pickup assembly comprising:

a cylindrical image pickup tube having a solid flat transparent plate at the front target electrode end of said tube,

a coil assembly disposed around said tube,

an adjustable clamping element mounted to said coil assembly about said tube,

said adjustable hard material clamping element being positioned about the periphery of the said flat plate and adjusted when mounting to compresses about the periphery of said flat plate to provide a rigid mounting between the coil assembly and the tube, and



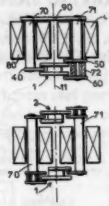
rear support means located near the end opposite plate end of the tube when mounted for centering and supporting the tube in the coil assembly.

4,191,937

ELECTROMAGNET MAGNETIC CIRCUIT WITH PERMANENT-MAGNET ARMATURE

Gerard Koehler, Ville D'Avray; Jean Aguettaz, Paris; Alain Berthelot, Evreux; Claude Genter, Paris, and Daniel Arnoux, St-Germain-en-Laye, all of France, assignors to Manufacture Francaise d'Appareils Electriques de Mesure, Conches-en-Ouche, France

Filed Apr. 18, 1978, Ser. No. 897,430
Claims priority, application France, Apr. 18, 1977, 77 11605; Jan. 24, 1978, 78 01912
Int. Cl.[2] H01F *7/08*; H01H *51/22*
U.S. Cl. 335—230 **26 Claims**



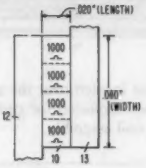
1. A magnetic circuit for a direct current electromagnet such as a relay electromagnet, comprising a fixed core, two yokes each connected to a respective free end of the core, and at least one armature movable between two end positions, said armature comprising a permanent magnet having flux input and output faces disposed at right angles to the magnet axis and each provided with a pole piece, each yoke having a flat portion having at least one air gap surface, the flat portions of the yokes being located in substantially parallel planes, said pole pieces having projecting end portions provided with air gap surfaces located on either side of the magnet axis, the flat portion of a first one of said yokes having two air gap surfaces and penetrating, with a clearance corresponding to the armature stroke, between the two mutually facing air gap surfaces of two end portions of the pole pieces located on a first side of the magnet axis, wherein the gap surfaces of the end portions of the pole pieces and of the flat portions of the yokes extend at right angles to the magnet axis, the armature is movable for translation in a direction corresponding substantially to the magnet axis, and, on a second side of the magnet axis, a second one of said yokes and a third yoke, both supported by a common free end of the core, have flat portions provided with mutually facing air gap surfaces between which two air gap surfaces belonging to at least one of the two pole pieces penetrate with a clearance substantially equal to the above-mentioned clearance.

4,191,938

CERMET RESISTOR TRIMMING METHOD

John Gow, 3rd, Owego; Herman S. Hoffman, Apalachin, and Earl Stephans, Chenango Forks, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 3, 1978, Ser. No. 921,291
Int. Cl.[2] H01C 10/00
U.S. Cl. 338—195 8 Claims



1. A method of trimming a thin film resistor which comprises the steps of:

fabricating on a substrate a thin film resistor material having a low length to width ratio;

establishing the sheet resistance of said material at 1000 ohms per square; and

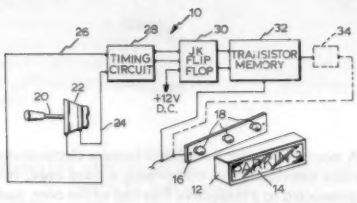
laser trimming said material to provide resistor values from 250 ohms to 16000 ohms.

4,191,939

VEHICLE PARKING SIGNALING DEVICE

Claire Bauman, 2860 S. Ocean Blvd., Palm Beach, Fla. 33480

Filed Sep. 18, 1978, Ser. No. 943,060
Int. Cl.[2] B60Q 1/00
U.S. Cl. 340—107 2 Claims



1. A warning device mounted upon a vehicle having left and right driver actuated turn signals and a turn signal actuating arm to provide adequate notice to a driver of a following vehicle that the lead vehicle is desirous of parking or is about to be parked, comprising:

an illuminable display means observable from the rear of said vehicle containing indicia representative that the vehicle is to be parked connected to said vehicle;

an electrical power supply means connected to said display means;

a means for switching said illuminable display means from an "off" position to an "on" position which is actuated by the driver connected to said turn signal actuating arm and said electrical power supply means;

said illuminable display means having at least one lightbulb and a translucent indicia display disposed adjacent said lightbulb; and

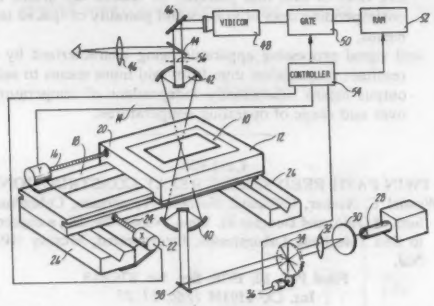
said display switching means connected to the turn signal actuating arm of said vehicle and actuated by rapid sequencing of said turn signals within a predetermined period of time between the left to right or right to left turn signal position to illuminate said parking display means.

4,191,940

METHOD AND APPARATUS FOR ANALYZING MICROSCOPIC SPECIMENS AND THE LIKE

Fabian C. Polcyn; Robert E. Marshall, and H. Janney Nichols, all of Ann Arbor, Mich., assignors to Environmental Research Institute of Michigan, Ann Arbor, Mich.

Filed Jan. 9, 1978, Ser. No. 867,979
Int. Cl.[2] G06K 9/00; G06M 11/00
U.S. Cl. 340—146.3 B 18 Claims



1. The method of forming an image map of a specimen based on properties of points on the specimen comprising: supporting the specimen on a stage; irradiating the specimen from a source and simultaneously detecting the resulting radiation from a particular point on the specimen at a plurality of different wavelengths to generate a first set of electrical signals having values representative of properties of said point; repeatedly translating the stage relative to the source to modify the point on the specimen from which the radiation is detected to generate a plurality of additional sets of electrical signals having values representative of the properties of other points on the object; processing each of the sets of signals to compare each subset on a multi-variate statistical basis with one of a plurality of spectral signatures representing differing properties; and generating a two-dimensional array of elements, each element having a position in the array which correlates with the position of one of the points on the specimen and each element having one of a plurality of forms dependent upon the signature with which the set of signals based on that point most closely compares as a result of said multi-variate statistical comparison process.

4,191,941

SWITCH MATRIX FOR DATA TRANSFERS

Joseph F. Springer, Philadelphia, Pa., and Donald H. Kaplan, Cherry Hill, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 3, 1978, Ser. No. 892,905
Int. Cl.[2] H04Q 3/00
U.S. Cl. 340—166 R 4 Claims

1. A switch matrix for connecting any one of a large number of communications lines transmitting a message header with any other non-busy one of the lines, comprising

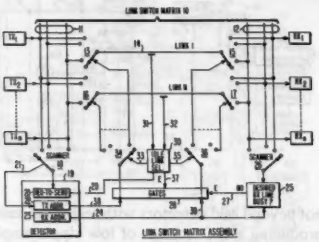
a plurality of connection links each including a multiplexer having a plurality of inputs coupled to respective transmitting lines and a transmitting address input for connecting an addressed one of the inputs to the output of the multiplexer, and a demultiplexer having an input connected to the output of the multiplexer, a plurality of outputs coupled to respective receiving lines, and a receiving address input for connecting the input to an addressed one of the outputs,

a transmitting line scanner including a message header decoder for identifying a line carrying a request-to-send

signal, the address of the line, and the address of a desired receiving line,

means responsive to a request-to-send signal from said decoder to select an unconnected link, said means including a link activity checker for each link to continuously monitor the passage of data through the respective link,

means responsive to the address of a desired receiving line to determine the not-busy condition of the line, and



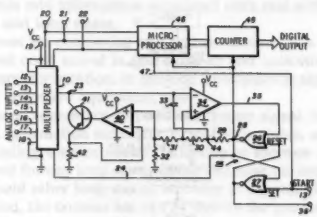
means conditional on the availability of an unconnected link and the not-busy condition of the desired receiving line to transmit the address of the transmitting line and the address of the desired receiving line to the selected link, whereby to connect the transmitting and receiving lines for the transfer of information.

4,191,942

SINGLE SLOPE A/D CONVERTER WITH SAMPLE AND HOLD

David K. Long, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 8, 1978, Ser. No. 913,632
Int. Cl.[2] H03K *13/02*
U.S. Cl. 340—347 AD **6 Claims**



6. An analog voltage to digital pulse converter circuit comprising in combination:

a bistable flip-flop having a first stable state defined as a conversion interval and a second stable state defined as a quiescent interval;

means for applying a set pulse to said flip-flop to initiate said conversion interval;

a capacitor;

means for coupling said capacitor to an analog voltage to be converted during said quiescent interval whereby said capacitor is charged to said analog voltage;

means for developing an increment of voltage and adding said increment to the charge on said capacitor during said conversion interval, said increment being small with respect to the expected range of analog voltages to be converted;

means for coupling a constant current load device to discharge said capacitor during said conversion interval, said discharge producing a linear decline in voltage with time;

means for developing a reference voltage that is greater than zero but less than said increment;

comparison means having two inputs and an output said inputs coupled to said capacitor and to said reference potential means and said output being coupled to said flip-flop to terminate said conversion interval when said capacitor voltage falls below said reference voltage whereby said conversion interval is linearly proportional to said analog voltage just prior to said initiation of said conversion interval.

4,191,943

FILLER-IN-PLASTIC LIGHT-SCATTERING COVER

Bruce R. Cairns, Los Altos, and David B. Crockett, San Jose, both of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Continuation of Ser. No. 733,554, Oct. 18, 1976, abandoned.
This application Mar. 17, 1978, Ser. No. 887,902
Int. Cl.[2] G08B *5/36*
U.S. Cl. 340—378.2 **22 Claims**

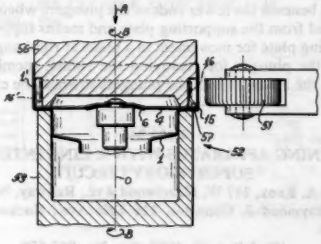
1. A cover with light-scattering characteristics for use with packages for displaying alpha-numeric characters, the cover comprising a layer of plastic having a multiplicity of small, solid light-conductive particles randomly located therein and scattered therethrough, wherein said particles have an index of refraction different from the index of refraction of the plastic layer and wherein said particles comprise six to twenty-five percent by weight of the cover.

4,191,944

ELECTROMAGNETIC SOUND GENERATOR AND METHOD OF MAKING SAME

Domenico Frigo, Olmo, Italy, assignor to Fiamm S.p.A. Fabbrica Italiana Accumulatori Motocarri Montecchio, Montecchio Maggiore, Italy

Division of Ser. No. 765,077, Feb. 3, 1977, Pat. No. 4,134,200.
This application Sep. 21, 1978, Ser. No. 944,567
Claims priority, application Italy, Feb. 4, 1976, 19876 A/76
Int. Cl.[2] G08B *3/10*
U.S. Cl. 340—388 **16 Claims**

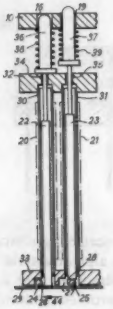


1. An electromagnetic sound generator comprising:

a housing of ferromagnetic sheet metal provided with an open end centered on an axis;

a circular ferromagnetic membrane, centered on said axis, spanning said open end;
an electromagnetic coil in said housing axially spaced from said membrane;
a ferromagnetic armature on said membrane extending axially into said coil;
an energizing circuit for said coil including interrupter means controlled by said armature; and
resonator means supported by said housing externally of said membrane, said housing having a peripheral wall forming a seat for said membrane and an end portion extending axially beyond said seat around at least part of said resonator means.

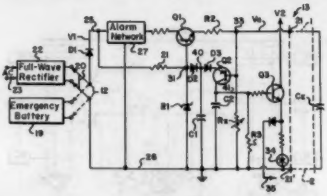
4,191,945
TACTILE INDICATING DEVICE
Martin R. Hannen, and David V. Charlesworth, both of Melbourne House, Melbourne Rd., Wallington, Surrey, England
Filed Jan. 16, 1978, Ser. No. 869,506
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—407 **6 Claims**



1. Electromechanical apparatus for setting up and erasing alpha-numeric characters and other symbols in braille comprising an array of spaced, parallel ferromagnetic plungers, a supporting plate, means supporting the plungers with their lower ends adjacent the supporting plate for axial movement perpendicular to the plane of the supporting plate, a solenoid winding disposed about each plunger within which the plunger is axially movable by energization of the solenoid winding, means for selectively energizing the solenoid winding for moving the plunger into operative position such that their upper ends define any desired characters and their lower ends are spaced from the supporting plate, rolling members on the supporting plate movable thereon into position beneath the lower ends of the plungers when the latter are moved into operative position, said rolling members being comprised of ferromagnetic metal so as to be drawn into said operative position beneath the lower ends of the plungers when the latter are raised from the supporting plate and means supporting the supporting plate for movement in a plane at right angles to the axis of the plunger for removing the rolling members from beneath the lower ends of the plungers to erase the characters.

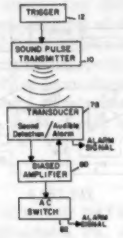
4,191,946
WARNING APPARATUS WITH A LINE INTEGRITY SUPERVISORY CIRCUIT
William A. Knox, 247 W. Hazelwood Ave., Rahway, N.J. 07065, and Raymond J. Gonzalez, 115 Erie Ave., Rockaway, N.J. 07866
Filed Oct. 20, 1977, Ser. No. 843,859
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—506 **8 Claims**

1. Warning apparatus for detecting abnormal conditions at spaced locations which comprises
(a) a two-conductor electrical transmission line,
(b) a source of substantially unfiltered rectified AC power for connection to one end of said line,
(c) a plurality of detectors connected across said line at spaced locations from said one end and adapted to respond to abnormal conditions at the respective locations,
(d) filter capacitance connected across said line at the end



thereof beyond said detectors with respect to said one end for producing a DC voltage of low ripple amplitude on said line,
(e) alarm means responsive to said detectors, and
(f) supervisory means responsive to ripple voltages at said one end of the line above a predetermined amplitude greater than said low ripple amplitude for indicating a trouble condition on said line.

4,191,947
INTRUSION ALARM SYSTEM
Andre C. Bouchard, Peabody; James C. Morris, Wakefield, both of Mass., and Robert L. Garrison, Henniker, N.H., assignors to GTE Sylvania Incorporated, Stamford, Conn.
Filed Sep. 6, 1978, Ser. No. 940,062
Int. Cl.[2] G08B *13/08*
U.S. Cl. 340—531 **14 Claims**

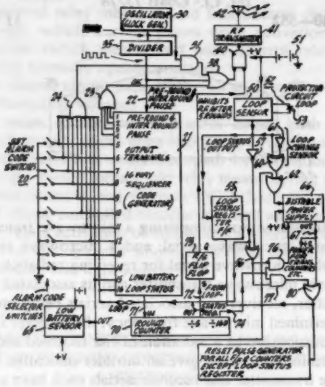


1. An intrusion alarm system comprising:
a sound pulse transmitter coupled to an entry means,
said transmitter including triggering means for activating said transmitter to emit a high intensity sound pulse having a predetermined discriminating characteristic upon intrusion of said entry means,
said transmitter comprising a photoflash unit and means activated by the radiant output of said photoflash unit for emitting said sound pulse,
a sound detector spaced from and in sound communication with said transmitter,
said detector including discriminating means selectively responsive to said predetermined characteristic of said sound pulse and substantially unresponsive to ambient sound conditions from other means,
and means responsive to said detector for producing an alarm signal upon detection of said sound pulse.

4,191,948
DIGITAL TRANSMISSION APPARATUS PARTICULARLY ADAPTED FOR SECURITY SYSTEMS

Roy Stockdale, Huntington, N.Y., assignor to Napco Security System Inc., Copiague, N.Y.

Filed Oct. 23, 1978, Ser. No. 953,482
Int. Cl.[2] G08B 3/10
U.S. Cl. 340—539 14 Claims



1. In a security system of the type employing a transmitter capable of transmitting a signal containing information as to the address code of a secured location by monitoring the opened or closed status of a loop associated with said location and transmitting said signal when the status of said loop changes, said signal containing additional information indicative of the loop status, and a remote receiver capable of receiving said transmitted signal, the combination therewith of apparatus located at said receiver and operative to monitor the total number of loop openings and closings, comprising:

(a) means responsive to said received signal for storing therein said information associated with said address code and said loop status,

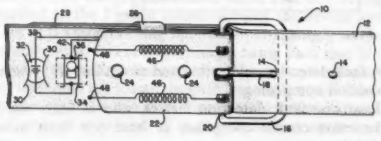
(b) means for comparing said address code with a predetermined code stored in said receiver and indicative of said transmitter location, to provide a comparison signal when said codes are equivalent, and

(c) means responsive to said comparison signal for storing said information indicative of said loop status, said means including a status counter effective to increase the count stored for one loop status and to decrease the count stored for said other loop status, whereby at the end of a desired period, the counter has stored therein the present status of said loop.

4,191,949
BELT HAVING A POSTURE WARNING DEVICE

Dick T. Myers, R.D. #2, Austin Dr., Willard, Ohio 44890

Filed Oct. 16, 1978, Ser. No. 951,524
Int. Cl.[2] G08B 21/00
U.S. Cl. 340—573 10 Claims



1. A belt having a posture warning device, comprising:

a belt strap having a buckle secured to one end thereof;

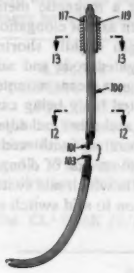
warning means interposed between said strap and said buckle for emitting a signal when relative movement between said strap and buckle exceeds a predetermined amount; and

biasing means interconnected between said buckle and strap for urging said buckle and strap into separated positional relationship with respect to each other.

4,191,950
ANTI-BED-WETTING DEVICE

Paul D. Levin, and Anne F. Levin, both of 1595 Soquel Dr., Santa Cruz, Calif. 95065

Continuation-in-part of Ser. No. 876,221, Feb. 9, 1978, abandoned. This application Jun. 28, 1978, Ser. No. 920,066
Int. Cl.[2] G08B 21/00
U.S. Cl. 340—604 2 Claims

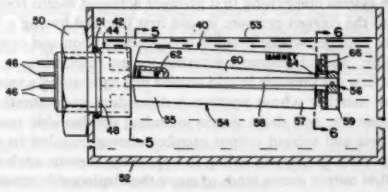


1. In an anti-bed-wetting device consisting of an electrical sounder adapted to be triggered by the closing of a pair of contacts, a sensor, and an electrically conducting means between said sounder and said sensor, the improvement comprising a sensor comprising two relatively long, narrow strips of a conductive fabric wherein said fabric has a conductive side and a nonconductive side, said strips being of substantially the same size and configuration and being placed in back-to-back relationship with the nonconductive sides of each sheet in contact with the other and a sheet of fabric or cloth enclosing said strips and at one end of said sensor two small patches of electrically conductive Velcro ® in back-to-back relationship, with the attaching sides of the Velcro ® facing outwardly, one of said Velcro ® patches being in electrical contact with each of said strips.

4,191,951
DEVICE FOR SENSING FLUID FORCES

Joe E. Fuzzell, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 16, 1977, Ser. No. 797,221
Int. Cl.[2] G08B 21/00; G01F 1/28
U.S. Cl. 340—610 4 Claims



1. A device for sensing forces exerted by fluids comprising:

(a) switch means capable of being actuated from a normal condition to an actuated condition without the exertion of substantial mechanical force thereon;

(b) first mounting means rigidly mounting said switch means for actuation;

(c) a body of low mass elongated along a given axis and having switch actuation means at one end thereof; and

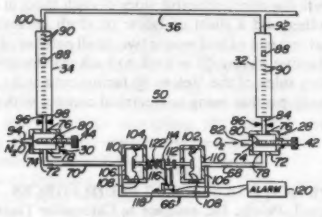
(d) second mounting means mounting said elongated body with said one end thereof adjacent said switch means, said second mounting means allowing pivotal movement of said given axis of elongation of said body in any direction about an end thereof but preventing substantial movement of said body along said given axis of elongation thereof and biasing said given axis of elongation of said body to a position in which said switch actuation means is in operative relation to said switch means actuating said switch means to said actuated condition thereof, said second supporting means comprising a pair of elongated rods of given length mounted at one end on said first mounting means and carrying a magnetic metallic plate at their other ends; said given axis of elongation of said elongated body having a length slightly shorter than said given length of said elongated rods and said elongated body having a second magnet means mounted in the other end thereof, said elongated body being carried between said elongated rods with said other end adjacent said magnetic metallic plate cooperating with said second magnetic means to bias said given axis of elongation of said body toward said position in which said switch actuation means is in operative relation to said switch means.

4,191,952

LOW OXYGEN FLOW ALARM FOR ANESTHESIA SYSTEMS

Peter J. Schreiber, and Joachim G. M. Schreiber, both of Zionsville, Pa., assignors to N.A.D., Inc., Telford, Pa.

Filed Aug. 25, 1978, Ser. No. 937,037
Int. Cl.² G08B *21/00*
U.S. Cl. 340—611 **10 Claims**



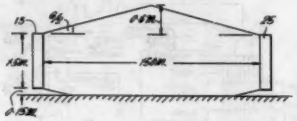
1. An alarm system for use with anesthesia apparatus supplying oxygen through one line into a manifold while supplying an anesthesia gas through a second line into the manifold, said alarm system comprising first pressure actuated means responsive to the oxygen pressure in said first line and having a first output member whose position is dependent upon said oxygen pressure, second pressure actuated means responsive to the anesthesia gas pressure in said second line and having a second output member whose position is dependent upon anesthesia gas pressure, and alarm means including displaceable means, said first and second output members being coupled to said displaceable means and acting in opposition therein, such that said first output means tends to move the displaceable means in a first direction while said second output means tends to move the displaceable means in a second direction, said alarm means producing an alarm signal wherever said displaceable means has been moved in said second direction to predetermined position.

4,191,953

INTRUSION SENSOR AND AERIAL THEREFOR

Alan D. Woode, South Queensferry, Scotland, assignor to Microwave and Electronic System Limited, Newbridge, Scotland

Continuation of Ser. No. 543,613, Jan. 23, 1975, Pat. No. 4,079,361. This application Jun. 6, 1977, Ser. No. 803,918
Claims priority, application United Kingdom, Jan. 23, 1975, 3209/75
Int. Cl.² G08B *13/18*
U.S. Cl. 340—552 **11 Claims**



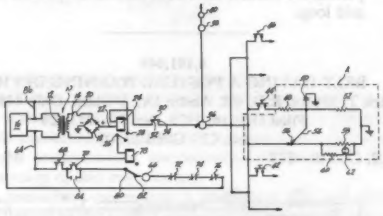
1. An intrusion sensor comprising a microwave transmitter and associated microwave aerial; and a microwave receiver and associated microwave aerial for receiving radiation transmitted by said microwave transmitter and its associated aerial, the transmitter, receiver and associated aerials being operable at a predetermined microwave frequency, the receiver including means responsive to a variation of the received radiation from an established level to give an intruder-indicative signal, wherein the transmitter and receiver aerials each have a vertical aperture dimensioned to provide at said predetermined frequency a beam pattern in a vertical plane, said vertical aperture being not less than 0.75 meters providing a beam pattern in a vertical plane, and said transmitter and receiver aerials are mounted adjacent the ground at opposite ends of a path to be monitored for the presence of intruders, the aerials being spaced along said path by a distance not exceeding that at which the striking angle to the ground of a notional ray traveling from the center of the receiving aerial by ground reflection equals half of the half-power beamwidth of either aerial, thereby providing in operation an intruder-sensitive zone of radiation which extends along said path contiguous to the ground substantially to each of said aerials.

4,191,954

INTERRUPTED CIRCUIT TEST WITH MEMORY AND DISPLAY DEVICE

Charles G. Faris, and Edward H. Manley, both of Sedalia, Mo., assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Jul. 3, 1978, Ser. No. 921,817
Int. Cl.² G08B *23/00*
U.S. Cl. 340—679 **8 Claims**



1. A fault detection, indication and motor cut off system, the combination comprising:

at least one fault detection circuit, said at least one fault detection circuit comprises at least one fault memory circuit;

said at least one fault memory circuit comprises a first circuit path, said first circuit path including a detector switch means and a silicon controlled rectifier gate connected in series and a second circuit path in parallel with said first

circuit path, said second circuit path including a silicon controlled rectifier and a light emitting source connected in series;

a source of DC voltage;

first control circuit path having two terminals for passing current through said path, one of said terminals being connected to said at least one fault detection circuit, the other of said terminals being connected to said source of DC voltage;

fault control relay means in said first control circuit path through which current passes upon activation of said detector switch means, said fault control relay means having normally opened contacts;

motor control circuit path connected at its ends to a source of alternating voltage;

relay means in said motor control circuit path through which current passes upon energizing of said fault control relay in said first controlled path by activation of said detector switch means, said relay means having normally closed contacts; and wherein DC voltage is supplied to said silicon controlled rectifier gate and said fault control relay upon activation of said detector switch so as to pass current through said silicon controlled rectifier thereby activating said light source.

4,191,955

METHOD OF CONTROL FOR AN ANALOG DISPLAY DEVICE OF THE NON-CONTINUOUS LIQUID CRYSTAL STRIP TYPE

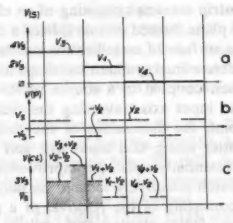
Jacques Robert, Saint-Egreve, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Sep. 16, 1977, Ser. No. 833,983

Claims priority, application France, Sep. 17, 1976, 76 27982

Int. Cl.² G06F *3/14*

U.S. Cl. 340—753 **7 Claims**



1. A method of control for an analog display device constituted by a band of liquid crystal along which is displayed a strip having a length which is a function of the value of a physical quantity to be displayed, said strip being non-continuous and formed by S sectors each consisting of P points, each sector being such as to comprise a plate electrode connected to a sector connection and placed opposite to P point electrodes connected to a set P of point connections, said liquid crystal being interposed between the plate electrodes and the point electrodes and being capable of assuming a first optical state 1 if the electrical excitation applied between electrodes is higher than a threshold value V_s and a second optical state 0 if said excitation is lower than said threshold value, a set of P voltages being applied to the P point connections of the device and a second set of S voltages being applied simultaneously to the S sector connections, said sets of voltages being such that in the case of one of the sectors designated as a boundary sector some points of the liquid crystal are in state 1 and other points are in state 0 and such that in the case of each of the other sectors the points of any one sector are all in one of the two states 1 or 0, wherein:

a voltage V_1 is applied to the plate connection of the boundary sector,

a voltage V_2 is applied to the point connections which are joined to the point electrodes of the boundary sector in which a state 0 must be displayed, said voltage being such that the resultant excitation at said points is lower than the threshold value V_s,

a voltage $-V_2'$ is applied to the point connections which are joined to the point electrodes of the boundary sector in which a state 1 must be displayed, said voltage being such that the resultant excitation at said points is higher than the threshold value,

a voltage V_3 is applied to the plate connections of the sectors in which all the points must be in state 1, said voltage being of sufficiently high value to ensure that the two resultant excitations at the different points of said sectors are both higher than the threshold value,

a voltage V_4 is applied to the plate connections of the sectors in which all the points must be in state 0, said voltage being of sufficiently low value to ensure that the resultant excitations are both lower than the threshold value,

all the applied voltages have the same frequency.

4,191,956

DEVICE FOR THE DISPLAY OF DATA ON A DISPLAY APPARATUS

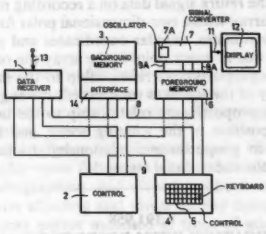
Hermanus H. H. Groothuis, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 17, 1978, Ser. No. 896,770

Claims priority, application Netherlands, Apr. 22, 1977, 7704398

Int. Cl.² G06K *15/18*

U.S. Cl. 340—789 **13 Claims**



1. A device for the simultaneous display of data in the form of a page on a display apparatus during a given time interval, comprising:

a data connection for receiving data signals;

a foreground memory having an input which is connected to said data connection and an output which is connected to an input of said display apparatus;

said foregound memory being adapted to store the data of a page during said interval;

said device furthermore comprising:

a control device;

a control member having an output which is connected to an input of a control device for unblocking the input of the foreground memory;

a background memory connect between said data connection and said foreground memory adapted to store the data of at least two pages, the input of which connected to the data connection being unblocked by an output signal of said control device;

said background memory comprising:

at least two parallel-connected serial sub-memories which together store the complete data of one page, the data of one character field being distributed between at least two parallel connected serial sub-memories;

said background memory being adapted to successively supply the data of a page, up to a predetermined length of the data under the control of a relative starting address signal from said control device, to the foreground memory by unblocking its input in order to progressively store

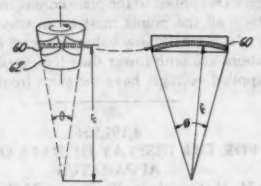
the data thus supplied as from a predetermined starting address in said foreground memory.

4,191,957

METHOD OF PROCESSING RADAR DATA FROM A ROTATING SCENE USING A POLAR RECORDING FORMAT

Jack L. Walker, and Walter G. Carrara, both of Ann Arbor, Mich., assignors to Environmental Research Institute of Michigan, Ann Arbor, Mich.

Filed Dec. 12, 1975, Ser. No. 640,570
Int. Cl.[2] G01S 9/02
U.S. Cl. 343—5 PC 13 Claims



1. In a method of range-Doppler imaging a scene which is rotating about an axis of rotation relative to a sensor wherein return signal data are sequentially received, coherently demodulated, and recorded preparatory to spatial imaging of the scene, the improvement which comprises:

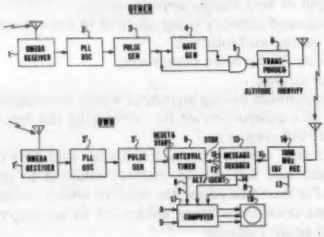
recording the return signal data on a recording medium in an ordered array with a two-dimensional polar format having radial coordinates, angular coordinates and position values such that at every point in the array the radial coordinate is in proportionate relationship to the instantaneous frequency of the signal as transmitted, the angular coordinate is in proportionate relationship to the instantaneous angular position of the rotating scene, and the position value is in proportionate relationship to instantaneous value of the radar signal strength.

4,191,958

RADIOLOCATION WITH RESPECT TO AN OWN STATION, USING OMEGA SIGNALS OR THE LIKE

Burton L. Hulland, Glenwood Landing, and George B. Litchford, Northport, both of N.Y., assignors to H & L Co., Glenwood Landing, N.Y.

Filed Apr. 3, 1978, Ser. No. 892,832
Int. Cl.[2] G01S 1/30
U.S. Cl. 343—105 R 10 Claims



1. The method of determining a line of position of a transmitter-equipped Other station with respect to an Own station, comprising the steps of

(a) receiving at both stations a repetitive timing signal from a reference transmitter at a known location,

(b) generating at each station a continuous train of brief pulses in fixed time relationship to said timing signals as received,

(c) selecting single pulses at intervals from said pulse train at said Other station, said intervals being substantially longer than the pulse repetition period of said train,

(d) triggering the transmitter at said Other station with said selected pulses to transmit messages in fixed time relationship to said selected pulses,

(e) receiving said messages at said Own station,

(f) measuring at said Own station the time delay of a predetermined timing mark in each received message with respect to the next preceding pulse of said continuous train, and

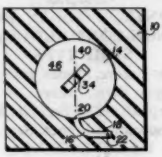
(g) producing from said measurement a representation corresponding to a line of position of said Other station as a specific curve having a focus at said Own station.

4,191,959

MICROSTRIP ANTENNA WITH CIRCULAR POLARIZATION

John L. Kerr, Neptune, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 17, 1978, Ser. No. 925,074
Int. Cl.[2] H01Q 1/38
U.S. Cl. 343—700 MS 16 Claims



1. In a microstrip antenna consisting of an electrically conductive ground plane formed on one side of a dielectric member which has a surface of metallization on the opposite side formed in a predetermined symmetrical shape to act as a radiating element when coupled to a source of RF input energy applied along an input axis traversing the radiating element from a feed point, the dimensions of the radiating element through the center along said input axis and perpendicular thereto being substantially equal, the improvement comprising:

a polarizing patch selectively located on said radiating element and consisting of the removal of a portion of the metallization of the radiating element in a predetermined elongated pattern oriented with a major axis and a minor axis each at an angle other than perpendicular relative to said input axis so as to provide two different electrical path lengths for respective orthogonal field components of the input energy, said different path lengths being adapted to produce elliptical polarization of the energy radiated from said radiating element.

4,191,960

PHASED ARRAY ANTENNA WITH REDUCED PHASE QUANTIZATION ERROR

Alfred R. Lopez, Commack, N.Y., assignor to Hazeltine Corporation, Greenlawn, N.Y.

Filed Jan. 27, 1978, Ser. No. 872,976
Int. Cl.[2] H01Q 1/50; H04B 7/00
U.S. Cl. 343—854 6 Claims

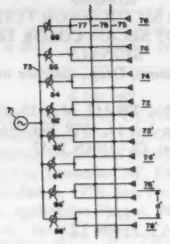
1. A phased array antenna system, comprising:

an aperture having a plurality of antenna elements symmetrically arranged with respect to a selected reference point on said aperture;

coupling means for supplying wave energy signals to said elements, said coupling means including digital phase shifters for varying the phase of said wave energy signals in discrete phase steps in response to supplied phase con-

trol signals, the phase length of said coupling means being selected to cause said wave energy signals to be supplied to all of said elements with a phase which is approximately an integral multiple of the smallest phase step of said phase shifters from a selected nominal phase value;

and means for supplying said phase control signals to said phase shifters to cause wave energy signals supplied to said elements to have a phase which approximates an ideal phase function of a desired radiation angle for each element, said ideal phase functions being selected to cause reinforcement of radiation from said elements in said desired angle and said ideal phase functions for symmetrically arranged element pairs having an average value for any radiation angle which is displaced from said nominal phase value by a selected phase displacement to cause the phase difference between signals supplied to the elements of each pair to be approximately within one-half said smallest phase step from the difference between said phase functions for said elements.



4,191,961

MAGNETIC PRINTING PROCESS AND APPARATUS

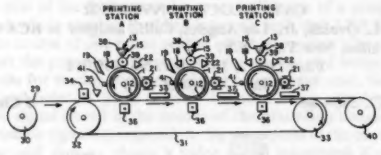
Donald W. Edwards, Wilmington, Del.; Emery J. Gorondy, Chadds Ford, and Arend van Roggen, Kennett Square, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 771,061, Feb. 25, 1977, which is a continuation-in-part of Ser. No. 672,552, Mar. 31, 1976, abandoned. This application Mar. 15, 1977, Ser. No. 777,241

The portion of the term of this patent subsequent to Jul. 4, 1995, has been disclaimed.

Int. Cl.[2] G01D *15/06*; G11B *9/00*

U.S. Cl. 346—74.1 **91 Claims**



1. Magnetic printing process comprising:

(a) providing a ferromagnetic material capable of continuously discharging an electric charge through its thickness to a grounded electrically conductive support on which it is imposed;

(b) forming a magnetic image on said ferromagnetic material by (i) magnetizing said ferromagnetic material in its entirety and thereafter heating one or more portions of said ferromagnetic material so as to at least partially demagnetize said portions; or (ii) magnetizing selected portions of said ferromagnetic material;

(c) developing said magnetic image by decorating it with a ferromagnetic toner comprising a ferromagnetic component and a resin which substantially encapsulates said ferromagnetic component;

(d) neutralizing static electricity on said ferromagnetic toner;

(e) removing from said ferromagnetic material neutralized toner particles which prior to neutralization had been adhered thereto by static electricity; and

(f) transferring the developed image to a substrate.

4,191,962

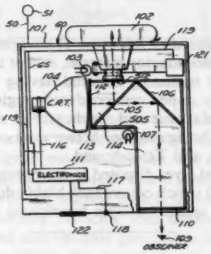
LOW COST MULTI-CHANNEL RECORDER AND DISPLAY SYSTEM FOR MEDICAL AND OTHER APPLICATIONS

Bohumir Sramek, 19211 Edgehill Dr., Irvine, Calif. 92715

Filed Sep. 20, 1978, Ser. No. 943,777

Int. Cl.[2] A61B *5/04*

U.S. Cl. 346—110 R **11 Claims**



7. A low-cost, multi-channel recorder and display system for medical and other applications comprising:

a cathode ray tube oscilloscope for displaying physiological phenomena;

means for simultaneously (i) continuously visually viewing the display upon the screen of said cathode ray tube and (ii) photographing said display without interrupting or otherwise affecting said visual display comprising:

a two-way mirror mounted in front of said cathode ray tube to provide a reflected and a through image of said display,

a second reflecting mirror mounted in the path of one of said through or reflected images of said display,

a camera mounted in the path of one of said reflected or through images of said display, and an operator window mounted in the path of one of the other of said reflected or through images.

4,191,963

BUILT-IN NOTCHED CHANNEL MOS-FET TRIODES FOR HIGH FREQUENCY APPLICATION

Pierre E. Schmidt, Estado Miranda, Venezuela, and Mukunda B. Das, State College, Pa., assignors to Instituto Venezolano de Investigaciones Cientificas (IVIC), Estado Miranda, Venezuela

Filed Nov. 21, 1978, Ser. No. 962,765

Int. Cl.[2] H01L *29/78*

U.S. Cl. 357—23 **19 Claims**

1. A built-in notched channel MOS-FET triode for high frequency application comprising:

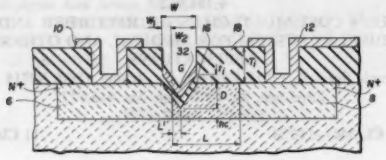
an insulating substrate;

semiconductor material covering at least a portion of a surface of said substrate, said semiconductor material including two highly doped regions of a given type of conductivity free of contact with one another;

a region of the given conductivity type disposed between said two highly doped regions, a notch extending through the surface of said semiconductor material, the width of said notch being less than the width of said semiconductor

region of the given conductivity type where width is measured along an axis perpendicular to the boundary between a highly doped semiconductor region and the region of given conductivity, said notch being disposed so that at least half of the width of said notch is in the region of given conductivity and said notch touches the boundary between one of said highly doped semiconductor regions and said region of given conductivity;

a first metal layer, covering at least some part of said notch;



insulating material of thickness T_i covering the top surface of said semiconductor material, except the area over said notch, said insulating material having an opening over each highly doped semiconductor region, and having a thickness of t_i over said notch, said insulating material of thickness t_i being disposed between sai notch and said first metal layer, and $T_i >> t_i$; and

a second metal layer disposed in the opening in said insulating material which covers each highly doped semiconductor region, said metal layer functioning as an electrode.

4,191,964

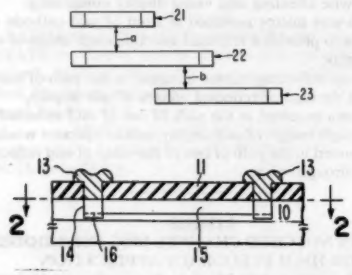
HEADLESS RESISTOR

Rajni Kant, San Jose, Calif., assignor to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Continuation of Ser. No. 760,593, Jan. 19, 1977, abandoned. This application Jun. 12, 1978, Ser. No. 914,637

Int. Cl.[2] H01L *27/02*

U.S. Cl. 357—51 **5 Claims**



1. A diffused resistor formed in a body of semiconductor material, said semiconductor material having an impurity concentration of less than 10^{17} atoms per cubic centimeter and having an overlying insulating layer, said diffused resistor comprising:

a resistor diffusion formed in said semiconductor body;

two contact diffusions formed in non-adjacent portions of said resistor diffusion, the configuration of said contact diffusions being substantially coincident with the shape of said resistor diffusion and adjacent said body of semiconductor material at the locations at which each of the contacts is made, said contact diffusion of such concentration to form an ohmic contact to a Schottky contact forming material; and

two ohmic contacts of a Schottky contact forming material for ohmically contacting each of said contact diffusions, each of said ohmic contacts being substantially coincident with the corresponding contact diffusion, said two ohmic contacts being substantially coincident with the corresponding contact diffusion, said two ohmic contacts being formed at a temperature of less than 520° C. to thereby form a Schottky diode between any portion of said ohmic contacts which is formed in contact with any portion of said semiconductor body.

4,191,965

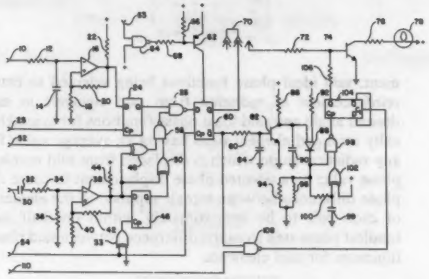
APPARATUS AND METHOD FOR TESTING COLOR SEQUENCING OF SECAM COLOR TELEVISION SIGNALS

Larry A. Nelson, Hillsboro, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 799,417, May 23, 1977, abandoned. This application Jul. 11, 1978, Ser. No. 923,755

Int. Cl.[2] H04N *9/62*

U.S. Cl. 358—10 **11 Claims**



1. The method of testing color sequencing of multiple color television signals, which comprises:

providing first signals representative of the sequence of the color television signals to be tested;

providing second signals representative of the sequence of a reference color television signal;

comparing said first and said second signals to obtain a third signal if the sequence of the color television signals to be tested is different from the sequence of said reference color television signal, said third signal providing immediate identification of said difference.

4,191,966

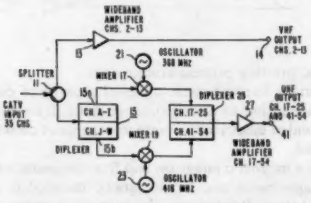
CATV BLOCK CONVERTER

John L. Ovnick, Jr., Los Angeles, Calif., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 2, 1978, Ser. No. 948,014

Int. Cl.[2] H04N *7/16*

U.S. Cl. 358—86 **5 Claims**



1. A cable TV converter for converting the cable TV midband channel frequencies of 120 to 174 MHz and the superband channel frequencies of 216 to 300 MHz to conventional TV tuner frequencies comprising:

filtering means responsive to said midband and superband

cable channel frequencies for separating said midband and superband channel frequencies,

first upconverting means coupled to said filtering means and responsive to said midband signals for upconverting all of said midband channel frequencies by a same fixed frequency to a first block of UHF TV tuner channel frequencies,

second upconverting means coupled to said filtering means responsive to said superband channel frequencies for upconverting all of said superband channel frequencies by a same fixed frequency to a second block of different UHF TV tuner channel frequencies, and

means coupled to said first and second upconverting means for combining said UHF channel frequencies.

4,191,967

INFRARED IMAGING DEVICE USING A PYROELECTRIC IMAGE TUBE

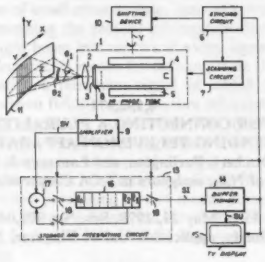
Jean Dansac; Christian Pepin, and Henri Cammas, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jan. 6, 1978, Ser. No. 867,408

Claims priority, application France, Jan. 21, 1977, 77 01741

Int. Cl.² H04N 3/16

U.S. Cl. 358—113 **7 Claims**



1. An infrared imaging device utilizing a pyroelectric image tube and comprising: shifting means for shifting the viewing axis of the tube relative to an observed scene to carry out a panning surveillance, reading means for scanning line by line the infrared image formed on the target of the tube to provide a corresponding video signal, and processing means for processing the video signal for use in a line scan television display, the said shifting means and reading means being so designed that the direction of the lines is perpendicular to the shifting direction of the axis and in that the speed of the shift is lower than that of the frame scan to cover a distance of a predetermined whole number R of line intervals such that $1 \leqq R \leqq n/2$, in the course of one frame period which comprises n lines and in that the processing means comprise storage and integrating circuits for storing the video signal of an image scan, line by line and point by point in each line after being added to the video signal stored in the course of the preceding image scan and which signal corresponds to the same point in the observed scene and thus to obtain a video signal integrated $K=n/R$ times for each point after K successive frame periods, and a buffer memory device to store the said integrated video signal and to provide the intended display signal.

4,191,968

VIDEO SIGNAL COMMUNICATIONS SYSTEM WITH IMPROVED SIGNAL-TO-NOISE RATIO

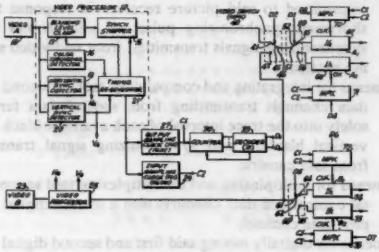
Donald Kirk, Jr., St. Petersburg, Fla., assignor to Digital Communications, Inc., St. Petersburg, Fla.

Filed Feb. 22, 1978, Ser. No. 879,860

Int. Cl.² H04N 5/21, 7/00

U.S. Cl. 358—141 **5 Claims**

1. In combination in apparatus for improving the signal-to-noise ratio of a transmitted video signal, a source of video information, storage means, means for reading a segment of the video information from said source thereof into said storage means, video signal processing means connected to said video source, said video processing means including means for providing a first signal comprising a measure of the average value of the video information over said segment and means for providing a second signal comprising a measure of the dynamic range of said video information relative to said direct current value over said timed segment, cascaded voltage shift-



ing means and variable gain means each connected to said video processing means and respectively controlled by said first and second signal provided thereby, and means for reading information out of said storage means to said voltage shifting means, said voltage shifting means including means for selectively substantially reducing said direct current video segment value, and said variable gain means including means for selectively amplifying the output of said voltage shifting means.

4,191,969

VIDEO COMPOSITE TRANSMISSION SYSTEM INTEGRATING ENCODED DATA CHANNELS INTO BLANKING AND SYNCHRONIZING SIGNAL

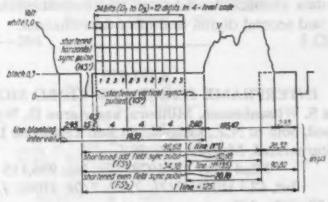
Marcel E. Briand, 67, rue de la Fougeraie Levis-St-Nom, Le Mesnil St Denis, France (78320), and Georges A. Pannetier, 12, rue de l'Amiral Roussin, Paris, France (75015)

Filed Mar. 27, 1978, Ser. No. 890,497

Claims priority, application France, Apr. 29, 1977, 77 12990

Int. Cl.² H04N 7/08

U.S. Cl. 358—145 **4 Claims**



1. A video composite transmission system connecting a camera and a picture receiver of a picture transmitting device and a plurality of data terminals to a video switching network via an analog two-path line transmitting an analog video composite signal, comprising:

means for shortening synchronizing pulses of first analog synchronizing signals transmitting from said camera, and thereby obtaining second analog shortened synchronizing signals having back blanking porches greater than those of said first synchronizing signals;

means for integrating and companding each of first digital data channels transmitting from first data terminals solely

into the back blanking porches of each recurrent line of said second shortened synchronizing signals:

means for extracting and reshaping said first digital data channels in response to said first digital companded data channels included in said second shortened synchronizing signals transmitted from said video switching network;

means for multiplexing and demultiplexing said first digital companded data channels into a first digital multiplex data channel;

means for reshaping said first analog synchronizing signals transmitted to said picture receiver in response to said shortened synchronizing pulses of said second analog synchronizing signals transmitted from said video switching network;

means for integrating and companding each of second digital data channels transmitting from second data terminals solely into the trace interval of each available black line of vertical blanking and synchronizing signal transmitted from said camera;

means for multiplexing and demultiplexing said second digital companded data channels into a second digital multiplex data channel;

means for digitally mixing said first and second digital multiplex data channels and thereby obtaining a digital mixed data channel;

means for converting said digital mixed data channel from binary code used in said data terminals into a mixed analog data channel in a 2^M-level code, M being an integer greater than or equal to 2;

means for analogically mixing said analog mixed data channel, said second analog shortened synchronizing signals and said video signal transmitted from said camera, and thereby obtaining said analog video composite signal transmitted to said video switching network;

means for analogically separating said analog mixed data channel, said second analog shortened synchronizing signals and said video signal in response to said analog video composite signal transmitted from said video switching network;

means for converting said analog mixed data channel in said 2^M-level code into said digital mixed data channel in binary code;

means for digitally separating said first and second digital multiplex data channels in response to said digital mixed data channel; and

means for extracting and reshaping said second digital data channels in response to said second digital companded data channels issued from said demultiplexing means of said second digital multiplex data channel.

4,191,970

INTERFRAME CODER FOR VIDEO SIGNALS

Hans S. Witsenhausen, Millburn, and Aaron D. Wyner, Maplewood, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

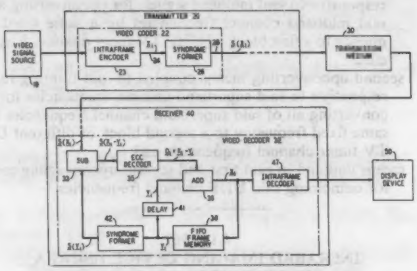
Filed May 15, 1978, Ser. No. 906,115

Int. Cl.[2] H04N *5/21, 7/12, 7/04;* H04L *1/10*

U.S. Cl. 358—167 **7 Claims**

3. A decoder for decoding received error-correcting code syndrome signals, said syndromes being derived from respective blocks of picture signals of a first frame of a video signal, said decoder characterized by

means for storing blocks of picture signals representing the frame of said video signal prior to said first frame, means including said storing means for forming the bit-by-bit exclusive-OR function of each received syndrome signal with a signal representing the syndrome of a corresponding block from the frame prior to said first frame to form a combined syndrome signal, an error correcting code decoder for decoding said combined syndrome signal to form a difference word signal, and means including said storing means for forming the bit-by-bit exclusive-OR function of a signal representing said previous-frame block



with said difference word signal, whereby a signal representing each of said first-frame blocks is recovered.

4,191,971

SYSTEM FOR CONNECTING A PLURALITY OF VIDEO SENDING TELEVISION APPARATUS

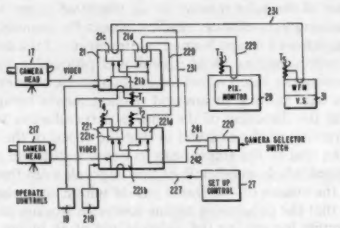
Robert A. Dischert, Burlington, and Laurence J. Thorpe, Marlton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 24, 1978, Ser. No. 909,040

Claims priority, application United Kingdom, May 30, 1977, 22806/77

Int. Cl.[2] H04N *5/30*

U.S. Cl. 358—210 **6 Claims**



1. A system for connecting a plurality of similar television video sending apparatus to a common receiver apparatus, comprising:

a plurality of television video sending apparatus each providing a source of video signals,

video receiver apparatus,

a single continuous cable transmission line terminated at both ends by a fixed impedance load and routed continuously and serially through each of said video sending apparatus and receiver apparatus,

each of said video sending apparatus including a current source, said current source coupled to said cable at said apparatus between said terminations, and means for applying said video signals at said apparatus to said current source to modulate the current and thereby provide video signals across said terminations without changing the impedance across the transmission line.

4,191,972

FLYING SPOT SINGLE FIELD SCAN TELECINE APPARATUS

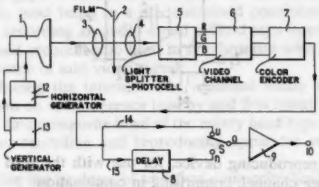
Raymond Matchell, Ware, England, assignor to The Rank Organisation Limited, London, England

Filed Dec. 30, 1977, Ser. No. 865,773

Claims priority, application United Kingdom, Jan. 27, 1977, 3336/77

Int. Cl.[2] H04N *3/36*

U.S. Cl. 358—214 10 Claims



1. In a flying spot telecine apparatus comprising means for driving a cinema film past a scanning position at a predetermined rate of film frames per second, means for optically scanning consecutive frames of a cinema film in raster fashion by a light beam of small cross-section, opto-electronic detector means for converting the picture information thereby modulated on the light beam into electrical video signal form, and video processing circuit means for deriving from the electrical video information a television signal of which consecutive groups of television fields contain picture information derived from scanning respective consecutive film frames, the improvement wherein the film driving means is adapted to drive the film with continuous motion, wherin the scanning means is adapted to make at least one field scan of each film frame, and wherein the video processing circuit means comprises means for deriving the picture information for all the television fields of each group from the said one field scan only of the respective film frame.

4,191,973

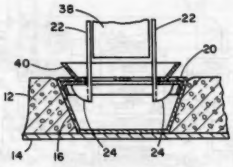
SHIELDING MEANS FOR TELEVISION PICTURE TUBE ELECTRICAL FEED-THROUGH RECEPTACLES

William J. Szydlowski, Deerfield, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Jul. 24, 1978, Ser. No. 927,313

Int. Cl.[2] H04N *5/65*

U.S. Cl. 358—245 3 Claims



1. In a television cathode ray picture tube having a glass envelope including a funnel and a faceplate, said tube generating X-radiation internally and incidental to its operation, said envelope having a wall in which is sealingly embedded open-side-out a cup-like receptacle having an inwardly turning annular lip for detachably engaging a mating electrical connector, an improved shielding means for enhancing the X-radiation-inhibiting characteristics of said receptacle comprising a cover of radiation-resistant material retained against said annular lip in a manner effective to close the opening of said cup-like receptacle whereby the shielding characteristics of said receptacle are enhanced by said cover.

4,191,974

FACSIMILE ENCODING COMMUNICATION SYSTEM

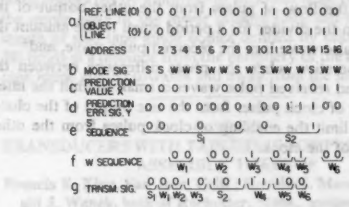
Fumitaka Ono; Takayoshi Semasa; Yutaka Ueno, and Shuzi Iwata, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 7, 1978, Ser. No. 875,909

Claims priority, application Japan, Feb. 8, 1977, 52-13432; Jun. 8, 1977, 52-68233

Int. Cl.[2] H04N *1/00*

U.S. Cl. 358—261 3 Claims



3. An encoding communication system for facsimile signals comprising means for sequentially obtaining prediction signals from picture elements adjacent to object picture elements in accordance with a predetermined prediction function; means for comparing said prediction signals with signals from corresponding ones of said object picture elements to generate a sequence of prediction error signals; means for encoding and transmitting said signal sequence of prediction error signals; said means for encoding and transmitting including: a mode selection circuit for selecting any one of a plurality of code forms predetermined by a pattern of adjacent picture elements upon encoding; an encoding means for encoding said prediction error signals on the basis of said code form selected by said mode selection circuit; and a mode switching means for sequentially transmitting said coded signals, starting with the coded signal in the mode having an untransmitted symbol pattern with the least address number among said signals to be encoded.

4,191,975

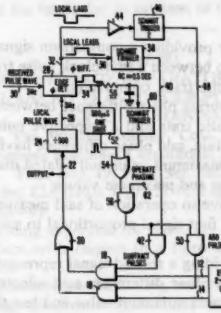
DIGITAL PHASE SYNCHRONIZING SYSTEM

Hugh E. White, Pennington, and Robert J. Petri, Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 23, 1978, Ser. No. 935,960

Int. Cl.[2] H04N *1/36*

U.S. Cl. 358—264 6 Claims



1. A system for phasing a local pulse wave with a received pulse wave, comprising

a phase detector having a local pulse wave inut and being

receptive to the received pulse wave, and having an output,

a two-phase clock having two outputs,

a pulse frequency divider coupled between the outputs of said clock and the local pulse wave input of said phase detector,

means responsive to the output of the phase detector to interrupt the flow of pulses from one output of the clock to the divider for a period equal to the amount the local pulse wave leads the received pulse wave,

means responsive to the output of the phase detector to enable the flow of pulses from the other output of the clock to the divider for a period equal to the amount the local pulse wave lags the received pulse wave, and

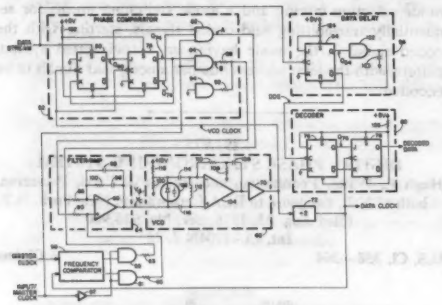
means operative when the phase difference between the local and received pulse waves is small to limit the interruption of clock pulses from the one output of the clock, and to limit the enabling of clock pulses from the other output of the clock.

4,191,976

CIRCUIT INDICATING PHASE RELATIONSHIP

William A. Braun, Acton, Mass., assignor to Data General Corporation, Westboro, Mass.

Filed Sep. 26, 1978, Ser. No. 945,980
Int. Cl.² G11B 5/09
U.S. Cl. 360—51 **20 Claims**



1. A circuit for providing a comparison signal representing phase relationship between a first clock pulse train and a variable rate input pulse train, comprising:

means for measuring phase difference between each pulse of said input pulse train and a respective pulse of said first clock pulse train, said phase difference having a minimum value and a maximum value and related discontinuities at said minimum and maximum values;

means responsive to operation of said measuring means for generating a first signal proportional to said phase difference;

means for providing a second signal representing a selected value of said phase difference, said selected value being greater than said minimum value and less than said maximum value; and,

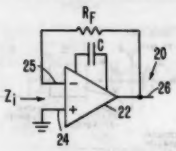
means for comparing said first and second signals to provide said comparison signal which represents difference between said selected and measured phase difference.

4,191,977

BIASING OF MAGNETORESISTIVE READ HEAD USING GYRATORS

Julian Lewkowicz, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 29, 1978, Ser. No. 947,308
Int. Cl.² G11B 5/47, 5/12
U.S. Cl. 360—66 **17 Claims**



1. A reproducing device, for use with the read chain of a recording channel, comprising in combination:

an M-R transducer;

a voltage supply source connected to the transducer;

a first operational amplifier means connected to a first terminal of the transducer;

a second operational amplifier means connected to a second terminal of the transducer;

a shared capacitive means interconnecting the first operational amplifier means and the second operational amplifier means;

a first feedback resistor operably associated with the first operational amplifier means; and

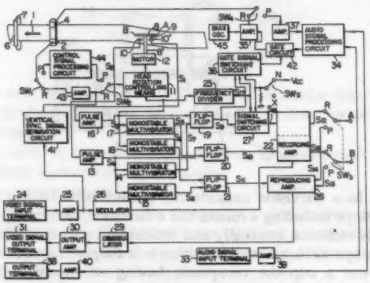
a second feedback resistor operably associated with the second operational amplifier means whereby each amplifier means, together with its associated feedback resistor and the shared capacitive means simulates an inductive means suitable for biasing said M-R transducer.

4,191,978

METHOD FOR ADJUSTING ROTARY HEAD TYPE MAGNETIC VIDEO RECORDING AND REPRODUCING APPARATUS

Mitsunobu Furumoto, Yao; Osahiko Yano, Kadoma; Satoshi Kikuya, Katano; Kanji Kubo, Katano, and Hideki Sakumoto, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 29, 1977, Ser. No. 855,707
Claims priority, application Japan, Dec. 3, 1976, 51-145788
Int. Cl.² G11B 5/56, 27/32
U.S. Cl. 360—75 **5 Claims**



1. A method for testing and adjusting a rotary head type magnetic video recording and reproducing apparatus having a first rotary head for recording and reproducing a video signal and a first composite head having a first control head and a first audio head, which comprises the steps of:

preparing a reference tape by recording a video signal intermittently to produce at least one unrecorded video track on said tape for every predetermined number of video tracks formed on said tape, said intermittent video signal being recorded by the scan of a second rotary head of a reference rotary head type magnetic video recording apparatus having a second composite head including a second control head and a second audio head which are arranged in a predetermined positional relation relative to a mounting position of said second rotary head with the head gaps of said second control head and said second audio head being in a predetermined positional relation, and recording an audio signal on said tape intermittently by said second audio head in synchronism with the intermittence of said video signal;

reproducing the intermittently recorded video and audio signals on said reference tape by said first rotary head and said first composite head of the rotary head type magnetic video recording and reproducing apparatus under test; and

adjusting the position of said first composite head with respect to a mounting position of said first rotary head such that the intermittence relation between a reproduced video signal from said first rotary head and a reproduced audio signal from said first audio head coincides with the intermittence relation between the video and audio signals during recording.

4,191,979

DEVICE FOR EXTRACTING AND POSITIONING VIDEO TAPE FROM A CASSETTE TO AROUND A SLIT HEAD DRUM

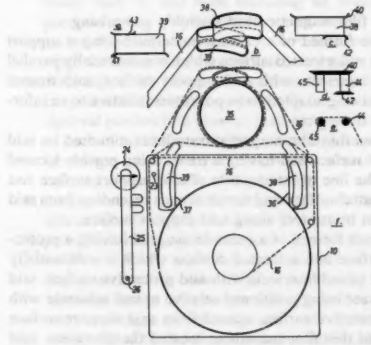
Herbert Poehler, Rosenstrasse 17, 6055 Hausen, Fed. Rep. of Germany

Filed Jul. 6, 1978, Ser. No. 922,499

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1977, 2730727; Aug. 10, 1977, 2735963

Int. Cl.[2] G11B *15/00*

U.S. Cl. 360—85 **20 Claims**



1. An apparatus for the recording and reproduction of signals, particularly video signals, on a magnetic tape (16) which is disposed in a cassette (1) on spools (11, 12) which lie concentrically one above the other, and having means whereby it is adapted to be laid, in two loops moving in opposite directions towards one another, against the periphery of a slit head drum (35), in which at least one magnetic head rotates, comprising a tape extraction device having a pair of grippers (38, 39) initially positioned within the cassette on the side of the tape remote from the drum, said device being mounted on a chassis plate, said grippers (38, 39) being disposed in different planes in their end position in which the magnetic tape (16) spans helically and contacts over an angle of at least 360° circumferentially around the head drum (35), the head drum having means whereby it is obliquely adjustable in relation to the chassis plate, one of said grippers being an upper gripper and said upper gripper (38) being in the form of an arcuate tape guide body and being disposed at a greater normal distance from the chassis plate (50), and having an upper edge (40) for positioning the upper edge of the tape, and the other gripper being a lower gripper (39) being disposed at a lesser normal distance from the chassis plate and being likewise in the form of an arcuate tape guide body and having a lower guide edge (41) for positioning the bottom edge of the tape, the vertical height of each gripper (38, 39) is slightly greater than the width of the magnetic tape (16), said upper gripper (38) in said end position being supported by a portion of its lower edge on a portion of the upper edge of the lower gripper (39), and the horizontal length of said tape guide bodies defined by said grippers (38, 39) holds at a distance from the periphery of the head drum the tape loops guided towards and away from the head drum (35).

4,191,980

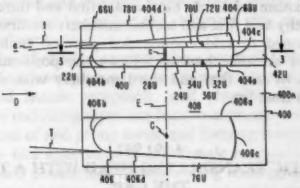
TRANSDUCERS WITH TAPERED EDGE PROFILES AND ASSEMBLY THEREOF

Francis K. King, San Jose, Calif.; Ronald J. Maurine, and Donald J. Wanek, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1978, Ser. No. 974,633

Int. Cl.[2] G11B *5/60, 5/82, 25/04*

U.S. Cl. 360—99 **8 Claims**



1. A magnetic transducer for use with a magnetic disk comprising:

a transducer body having a pair of magnetically permeable core pieces extending therethrough,

an active surface on said transducer body having a pair of lands adapted to contact or be in near contact with the magnetic disk as the disk rotates with said lands being separated by a groove extending longitudinally of said active surface,

said core portions having a transducing gap therebetween on one of said lands on said active surface,

each of said lands broadening longitudinally of said surface from a leading end of the transducer to the trailing end of the transducer whereby to modify the air pressure effective on the lands due to rotation of the disk.

4,191,981

RECORD STORAGE APPARATUS EMPLOYING ENHANCED TRANSDUCER POSITIONING SERVOMECHANISMS

Howard E. Van Winkle, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 19, 1975, Ser. No. 642,646

Int. Cl.[2] G11B *5/012, 5/016*; G05B *11/18*

U.S. Cl. 360—99 **5 Claims**

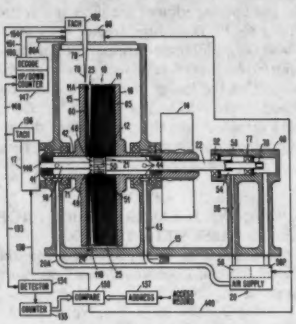
1. Positioning apparatus for relatively moving first and second members with respect to a third member, including in combination:

a first servomechanism having motive means for relatively moving said first and third members to a commanded position;

means for indicating relative position of said first and third members at least at said commanded position;

a second servomechanism having motive means for rela-

tively moving said second and third members in accordance with said indication including means comparing said indication with relative position of said second and third members for stopping said relative movement of said second and third members upon obtaining a predetermined comparison and for actuating said relative movement of said second and third members upon other than said predetermined comparison and said second servo-



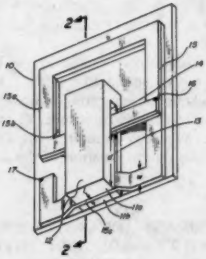
mechanism only being capable of relatively moving said second and third members slower than said first servomechanism relatively moves said first and third members whereby said first and second members are first relatively positioned to said commanded position such that said second servomechanism follows the positioning movements of said first and third members with a predetermined time lag.

4,191,982

MAGNETIC TRANSDUCING HEAD WITH A TURN IN THE GAP

William P. Wood, St. Louis Park, and Raymond E. Jutila, Wayzata, both of Minn., assignors to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Jul. 24, 1978, Ser. No. 927,320
Int. Cl.[2] G11B 5/20
U.S. Cl. 360—123 **6 Claims**



1. A magnetic transducing head comprising

(a) a magnetic core having a transducing face, a loop area defined by an opening through the core, and a flux gap extending from the transducing face to the loop area and defined by flux gap faces, said flux gap having a length dimension substantially parallel to the transducing face which is substantially shorter than the maximum loop area dimension in the flex gap length direction; and

(b) a multi-turn winding having end taps serving as signal terminals, and having at least one turn passing through the loop area and surrounding a part of the core defining the loop area, and at least one other turn passing through the flux gap between the flux gap faces adjacent the transducing face, surrounding a part of the core defining the loop area, and occupying substantially less than the entire gap height in the gap;

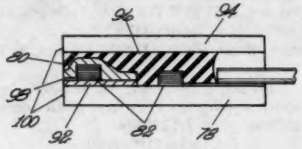
whereby a portion of the flux generated by the gap turn when current is passed through it leaks through the flux gap between the loop area and the gap turn and opposes flux generated by the loop turn, thereby increasing the apparent gap reluctance and fringing flux adjacent the transducing face.

4,191,983

THIN FILM MAGNETIC HEAD ASSEMBLY HAVING A THIN FILM MAGNETIC TRANSDUCER ENCAPSULATED IN INSULATING BONDING MATERIAL

George W. Gibson, Goleta, Calif., assignor to Applied Magnetics Corporation, Goleta, Calif.

Division of Ser. No. 809,924, Jun. 24, 1977, Pat. No. 4,143,458. This application Apr. 4, 1978, Ser. No. 893,472
Int. Cl.[2] G11B 5/12, 5/20, 5/22
U.S. Cl. 360—125 **4 Claims**



1. A thin film magnetic head assembly comprising

a substrate formed of a ceramic material having a support surface and a treated surface which is substantially parallel to and intersects with said support surface, said treated surface being adapted to be positioned relative to an information storing media;

at least one thin film magnetic transducer mounted on said support surface and having a transducing portion located along the line of intersection of said support surface and said treated surface and terminal pads extending from said thin film transducer along said support surface;

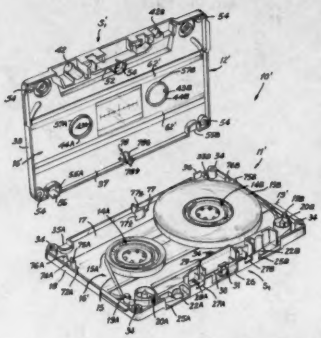
a superstrate formed of a ceramic material having a protective surface and a treated surface which is substantially parallel to and intersects with said protective surface, said superstrate being positioned relative to said substrate with said protective surface spaced from said support surface with said thin film transducer located therebetween, said treated surface of the substrate and superstrate and the transducing portion of said thin film transducer being positioned in planar alignment;

an insulating bonding material located in the space between said protective surface and said support surface and bonded thereto; said insulating bonding material being selected of a material which is electrically and mechanically compatible with the thin film magnetic transducer and which has a melting point temperature below a thermal stress temperature at which at least one of the electrical characteristics and the magnetic characteristics of the thin film magnetic transducer are permanently distorted and encapsulate said thin film transducer with the transducing portion thereof being exposed to and in planar alignment with said treated surface.

4,191,984
TAPE CASSETTE

Yoshitaka Tsukidate, Tagajyo, and Shin Sasaki, Tagahyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 9, 1978, Ser. No. 914,574
Claims priority, application Japan, Jun. 10, 1977, 52-74776[U]
Int. Cl.² G11B *23/06, 15/32;* G03B *1/04*
U.S. Cl. 360—132 13 Claims



1. A tape cassette comprising:

a housing including a pair of opposed, spaced apart walls, each of said walls having a pair of spaced apart openings therein which are aligned with corresponding openings in the other of said walls and annular flanges extending around said openings and being directed axially therefrom at the side of the respective wall facing toward said other wall;

a pair of hubs disposed within said housing between said walls, each of said hubs including an outer peripheral portion having a cylindrical circumferential surface and an annular rib spaced radially inward from said circumferential surface and having an axial dimension greater than the axial width of said circumferential surface so as to project axially beyond opposite flanks of said outer peripheral portion into close proximity to said walls, said rib of each of said hubs extending rotatably around said annular flanges associated with respective ones of said aligned openings in said walls of the housing;

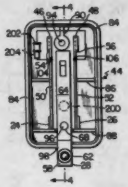
a magnetic tape in said housing wound on the cylindrical circumferential surfaces of said hubs; and

a pair of lubricating sheets disposed against the sides of said walls which face toward each other, each of said lubricating sheets having a pair of holes therein aligned with said openings in the adjacent one of said walls and with said annular flanges of said adjacent wall extending through said holes of the lubricating sheet, and each of said lubricating sheets further having a pair of ridges projecting therefrom in the direction away from said adjacent wall, said ridges on each sheet being spaced apart with said holes located between said ridges and with the distance between said ridges, at least at the region of each of said holes, being larger than the outer diameter of said rib of each hub and no greater than the diameter of said circumferential surface of the hub, each of said sheets having flat surface portions between said holes and said ridges engageable by said ribs of the hubs for providing axial bearings for the latter, and said ridges of the lubricating sheets extending at least substantially to said flanks of the outer peripheral portion of each of said hubs for accurately guiding said tape therebetween when being wound on said hubs.

4,191,985
INTERRUPTER

Charles M. Phillips, Jr., 315 Haven St., Clearwater, Fla. 33516

Continuation-in-part of Ser. No. 644,422, Dec. 24, 1975, Pat. No. 4,075,676, and a continuation-in-part of Ser. No. 713,844, Aug. 12, 1976. This application Sep. 16, 1977, Ser. No. 833,767
The portion of the term of this patent subsequent to Feb. 21, 1995, has been disclaimed.
Int. Cl.² H02H *3/22*
U.S. Cl. 361—56 9 Claims



1. An interrupter device for interrupting electrical current used by a household electrical appliance and for diverting current from electrical equipment connected to telephone lines, comprising:

a housing supporting a grounding prong means and two prong means adapted to be inserted into a grounded electrical outlet and a female receptacle including three apertures adapted to receive the electrical plug connector of an appliance;

a plurality of conductor means for electrically interconnecting of each same prong means to a corresponding element of said female receptacle, said plurality of conductor means including three conductive elements being unitary portions of said prong means and forming contact portions below said appertures of said female receptacle;

two of said conductive elements being rectangular and each having a unitary prong means extending substantially perpendicular from one end of said conductive elements in a first direction and a contact portion extending substantially perpendicular from the other end of said conductive elements in an direction opposite said first direction;

variable impedance means connected between two conductors of said interconnecting conductor means for temporarily interrupting current flow to said female receptacle at high voltage levels by creating a path of low resistance between said two interconnecting conductor means, said variable impedance means including a varistor in series with a thermofuse, said varistor and said thermofuse being in thermal cooperation whereby heat generated by said varistor causes said thermofuse to actuate and said thermofuse becomes an open circuit.

4,191,986
POWER LINE TRANSIENT SUPPRESSORS

Kwang ta Huang, Ventura, and Brian R. Milner, Camarillo, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 12, 1978, Ser. No. 905,323
Int. Cl.² H02H *3/08*
U.S. Cl. 361—58 5 Claims

1. In an electrical circuit having a first pair of terminals connected to an input source of AC electrical energy and a second pair of terminals connected to a load which is energized by said AC energy source, the improvement comprising a transient energy suppression circuit, connected in series with the load for rejecting or attenuating voltage transients which occur in circuit power lines to the load, and which comprises:

a. a first and a second inductor means connected in series with the load;

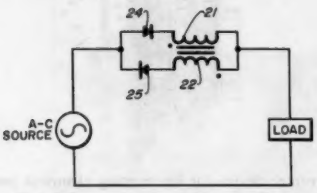
b. a first and a second one-way electrical valve means connected in series with said first and second inductor means,

respectively, permitting current to flow in one direction only through each of said first and said second inductor means alternately during alternate half-cycles of energy from said AC source;

c. said first and second inductor means being magnetically coupled together;

d. said first and said second inductor means connected together in series with respective said first and said second one-way electrical valve means comprising:

said first inductor means and a first diode in series connected in parallel with said second inductor means and a second diode in series;



the series connections being of the same polarity and the parallel connections being of reverse polarity;

said magnetic coupling of said first and said second inductors and the connection arrangement resulting in inductor currents being reduced to zero alternately in said first and second inductors during alternate half-cycles thereby avoiding continuous circulating currents simultaneously in both inductors;

e. said circuit operating to attenuate and absorb energy caused by high transient voltages that may occur due to power supply anomalies, thereby protecting the load.

4,191,987

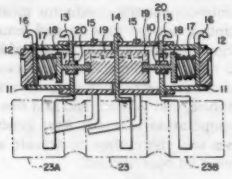
CLIP-ON PROTECTOR

Gerald Coren, 18 Willben La., Plainview, N.Y. 11803

Filed Feb. 24, 1978, Ser. No. 880,756

Int. Cl.² H02H *3/22*

U.S. Cl. 361—124 **17 Claims**



1. Supplementary protection means for preventing the burn out of an over-voltage protector and the apparatus protected by same and wherein the over-voltage protector has a casing and spaced electrodes, comprising plungers with shafts substantially parallel to the axis of the protector to conserve space, each of said plungers connected to ground and oriented to potentially ground a different spaced electrode of said protector, resilient means urging said plungers towards a condition of electrical contact with said electrodes, heat conduction means for conducting heat from said protector case to fusible means during sustained overload, said fusible means comprising a fusible element in pressure engagement with said plunger, said fusible means located at a place remote from the protector but oriented to maintain said plungers and said electrodes in insulating relationship except during a condition of sustained overload threatening to burn out said protector which condition causes said fusible means to fuse whereupon said grounded plungers are urged into electrical contact with said electrodes, and grounding means for grounding said plungers whereupon fusing of said fusible means causes said electrodes to be grounded.

4,191,988

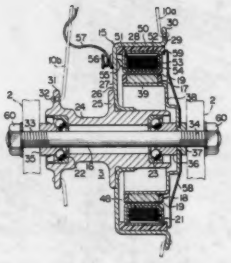
IDENTIFICATION LAMP APPARATUS

Shokichi Kumakura, 5-3, Funabori 2 chome, Edogawa-ku, Tokyo, Japan

Filed Dec. 27, 1977, Ser. No. 864,290

Int. Cl.² F21L *13/00*

U.S. Cl. 362—72 **3 Claims**



1. An identification lamp apparatus to be mounted on a wheel of a bicycle which rotates around a stationary shaft, comprising a lamp carried by the wheel, a hub rotatably mounted on the shaft, a hub wheel secured to the hub and including a first annular portion which defines an annular space around the hub, a drum member having a second annular portion which extends axially into the annular space, a sideplate mounted on the drum member and disposed radially to extend perpendicularly to the second annular portion, a stator assembly including permanent magnets and slidably supported on the outer surface of the second annular portion, a rotor assembly including a coil to produce an electric power thereacross, the rotor assembly being fixedly mounted on the inner surface of the first annular portion, a lining mounted between the permanent magnets and the outer surface of the second annular portion, and adjusting screw means provided on the sideplate and extending into said annular space for selectively locking the permanent magnets to the drum member to adjust whether the lamp is to be energized or deenergized.

4,191,989

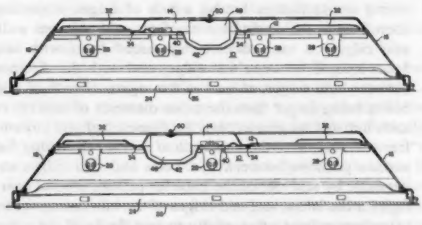
RECESSED INTERIOR FLUORESCENT LUMINAIRE

Burford J. Page, and Winfried N. Westermann, both of Vicksburg, Miss., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 9, 1978, Ser. No. 876,394

Int. Cl.² F21S *3/00*

U.S. Cl. 362—220 **5 Claims**



1. An interior fluorescent luminaire of either the four lamp or three lamp type comprising:

a luminaire housing including;

a top wall, a pair of end walls and a pair of side walls defining a bottom opening;

a refractor closing off said bottom opening for distributing light emanating from said luminaire;

a plurality of oppositely disposed lamp holders mounted to each of said end walls; and

a reversible ballast housing cover mounted to the underside of said top wall constructed and arranged to be removably secured thereto in either a first or second position to thereby accommodate either three or four equidistantly spaced fluorescent lamps in a planar array.

4,191,990

ARRANGEMENT FOR ADJUSTING HEADLIGHTS

Maarten C. Beeftink, Heerlen, Netherlands, and Manfred Helgers, Geilenkirchen-Lindern, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 15, 1977, Ser. No. 824,522

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1976, 2637485

Int. Cl.² F21V *11/00*

U.S. Cl. 362—276 **8 Claims**

1. An arrangement for monitoring the brightness distribution of the light beam produced by a headlight comprising a convergent lens for passing the lightbeam onto a frosted glass screen, a television camera arranged to pick-up the brightness picture on the frosted glass screen, a non-linear amplifier, and means connecting the output of the television camera through said non-linear amplifier to the input of a monitor.

4,191,991

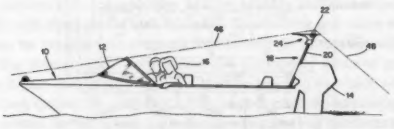
LIGHT SHIELD FOR MAST-MOUNTED NAVIGATION LIGHTS

Charles J. Sorlien, 7005 W. 23rd St., St. Louis Park, Minn. 55426

Filed Oct. 17, 1977, Ser. No. 842,726

Int. Cl.² F21Y *17/02*

U.S. Cl. 362—319 **9 Claims**



1. A shield for mast-mounted navigation lights comprising a shade panel having a hole therein for accommodating the upper portion of the mast supporting the navigation light at the top thereof, a pair of side panels having edges thereof secured to the underside of said shade panel and said side panels extending downwardly from said shade panel in the vicinity of said hole, and means for clamping said side panels against opposite sides of said mast so as to adjustably position said shade panel in a preferred position in relation to the navigation light atop said mast.

4,191,992

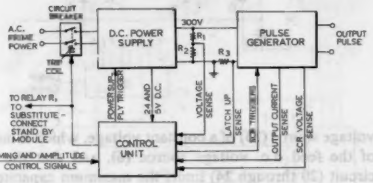
METHOD OF AND APPARATUS FOR ENABLING SOFT-FAILURE OF MODULAR POWER CONVERTER SYSTEMS, INCLUDING RF GENERATOR SYSTEMS, EMBODYING SWITCHING COMPONENTS IN THE POWER CONVERSION

Paul R. Johannessen, Lexington, Mass., assignor to Megapulse Incorporated, Bedford, Mass.

Filed Feb. 23, 1978, Ser. No. 880,842

Int. Cl.² H02M *1/18*

U.S. Cl. 363—50 **20 Claims**



13. Power conversion apparatus having, in combination, a plurality of pulse generator modules having input circuits connected to a control module and output circuits coupled to a common load; each pulse generator module comprising a pulse generator comprising switching means such as SCRs, an individual DC power supply fed by circuit-breaker means from an AC power source to supply main DC power to the pulse generator that is switched by the switching means, and a control unit connected to said control module to receive timing and amplitude control signals therefrom and connected to trigger the DC power supply and the SCR operation in said pulse generator; a first feedback connection from the said pulse generator to said control unit sensing output current of the said pulse generator to control the output pulse amplitude and timing and to enable fault detection; a second feedback connection from the said pulse generator to said control unit sensing the SCR voltage to protect the SCR switching means in the pulse generator from overvoltage; a latch-up sense connection from the input of said pulse generator to said control unit; and means connected with said control unit and responsive to failure indication by any of the latch-up sensing, pulse generator output current and fault sensing, and SCR overvoltage sensing, for controlling said circuit breaker means to render the failed pulse generator module ineffective in said system.

4,191,993

INVERTER COMPRISING AT LEAST TWO CONTROLLABLE LOAD THYRISTORS

Gerhard Kratz, Erlangen, and Werner Kuehnel, Uttenreuth, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 18, 1978, Ser. No. 943,067

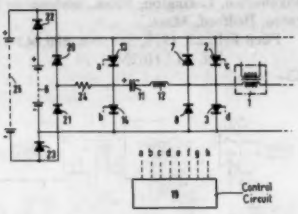
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1977, 2746099

Int. Cl.² H02M *7/515*

U.S. Cl. 363—135 **5 Claims**

1. An inverter comprising at least two controllable load thyristors to which a control device is connected which alternately switches them on for the purpose of alternate connection of a load to the poles of a feed d.c. voltage source, wherein there is connected, in antiparallel fashion, with each load thryistor, one diode each which is a component of a commutation installation for the corresponding load thyristor, which commutation installation manifests an LC-series oscillatory circuit dimensioned for a specified load current, and which manifests, for each load thyristor, a controllable commutation thyristor connected to the control device, whereby each commutation thyristor forms a closed circuit with the LC-series oscillatory circuit and its diode, such that the energy of the LC-series oscillatory circuit, during commutation, in each

instance changes over to a low-impedance commutation path which is free of the load and of the feed d.c. voltage source, characterized in that the LC-series oscillatory circuit (11, 12) is connected via a reloading circuit (20 to 24) to an auxiliary d.c.



voltage source (25) of a constant voltage, which is independent of the feed d.c. voltage source (6), and that the reloading circuit (20 through 24) limits the maximum capacitor voltage to the voltage of the auxiliary d.c. voltage source (25).

4,191,994

INVERTER COMPRISING AT LEAST TWO CONTROLLABLE LOAD THYRISTORS

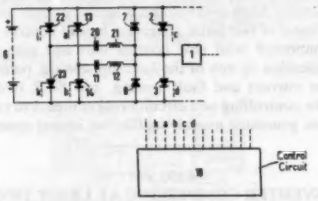
Gerhard Kratz, Erlangen, and Werner Kuehnel, Uttenreuth, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 18, 1978, Ser. No. 943,068

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1977, 2746115

Int. Cl.[2] H02M *7/515*

U.S. Cl. 363—135 **2 Claims**



1. An inverter comprising at least two controllable load thyristors to which a control device is connected which alternately switches them on for the purpose of alternate connection of a load to the poles of a d.c. voltage source, wherein one diode each is connected in antiparallel fashion to each load thyristor, said diode being a component of a commutation installation for the corresponding load thyristor which commutation installation manifests an LC-series oscillatory circuit dimensioned for a specified load current and a controllable commutation thyristor, connected to the control device, for each load thyristor, whereby each commutation thyristor forms a closed circuit with the LC-series oscillatory circuit and its diode, such that the energy of the LC-series oscillatory circuit, during commutation, in each instance swings over to a low-impedance commutation path which is free of the load and the d.c. voltage source, characterized in that an additional LC-series oscillatory circuit (20, 21), dimensioned for a second load current, is present, to which switching means (22, 23) are connected which connect the latter into the commutation installation (7, 8, 11 through 14, 20 through 23), instead of the first-mentioned LC-series oscillatory circuit (11, 12).

4,191,995

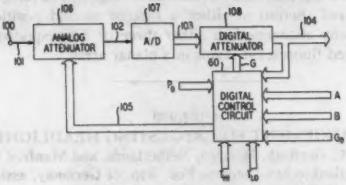
DIGITAL AUTOMATIC GAIN CONTROL CIRCUIT

Cecil W. Farrow, Highlands, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 2, 1979, Ser. No. 5

Int. Cl.[2] G06F *15/46*

U.S. Cl. 364—113 **10 Claims**



1. Digital automatic gain control apparatus of the type including a first variable attenuator (106, 107) responsive to a first control signal (105) for applying controlled attenuation to an analog input signal (101) and a second variable attenuator (108) for applying controlled attenuation to a digital representation (103) of an output signal from the first attenuator (106, 107) to generate a gain adjusted output signal (104),

digital control means (60) responsive to the gain adjusted output signal (104) for generating the first control signal (105) and for generating a second control signal (G) to cause incremental adjustment of the attenuation applied by the second attenuator (108) when the first control signal (105) maintains the attenuation applied by the first attenuator (106, 107) nominally constant and to cause a substantial adjustment of the attenuation applied by the second attenuator (108) to a prescribed intermediate setting (G_0) between predetermined maximum and minimum attenuation settings (T_{HI},T_{LO}) for the second attenuator (108) counteracting the simultaneous attenuation adjustment of the first attenuator (106, 107).

4,191,996

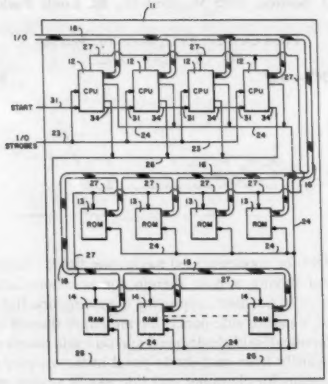
SELF-CONFIGURABLE COMPUTER AND MEMORY SYSTEM

Gilman D. Chesley, 22431 Starling Dr., Los Altos, Calif. 94022

Filed Jul. 22, 1977, Ser. No. 818,235

Int. Cl.[2] G06F *11/04*

U.S. Cl. 364—200 **14 Claims**



1. In an integrated circuit structure: a semiconductor wafer having a plurality of CPU, ROM and RAM modules formed thereon, each of said ROM modules containing CPU and

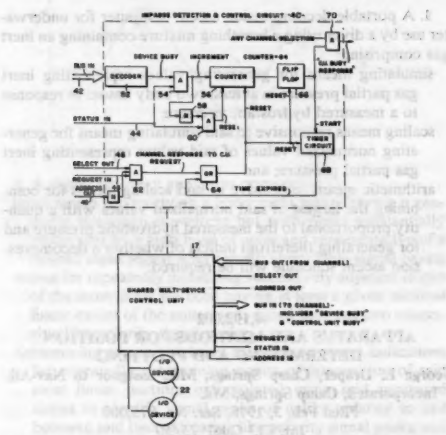
RAM testing information, a common bus on the wafer connected directly to each of the CPU, ROM, and RAM modules, means for enabling a first one of the CPU modules to seqeuntially test the ROM modules until a good ROM is found, means for successively enabling the CPU modules to sequentially test themselves with information from the good ROM module until a good CPU module is found, and means for enabling the good CPU to test the RAM modules.

4,191,997

CIRCUITS AND METHODS FOR MULTIPLE CONTROL IN DATA PROCESSING SYSTEMS

Fernando A. Luiz, Monte Sereno, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 10, 1978, Ser. No. 894,738
Int. Cl.[2] G06F *3/04*
U.S. Cl. 364—200 **12 Claims**



1. In a system in which different asynchronous processors operate in conjunction with a shared control unit which in turn controls and monitors the status of more than one peripheral device, with the control unit responding to processor initiatives with indications of the status of peripheral devices and the control unit itself while also being required to reconnect to a processor for completion of a previously initiated sequence, but with the control unit normally functioning as a slave which may be required to respond repetitively to initiatives without being able to effect completion of a previously initiated action, such that an impasse condition can be reached in which needed action cannot be generated, the improvement comprising:

means for detecting an unbroken sequence of predetermined length of device busy response signals provided from said control unit;

means responsive to the detecting means for initiating a control unit busy signal such that the control unit independently initiates a busy indication to at least one of the processors, and

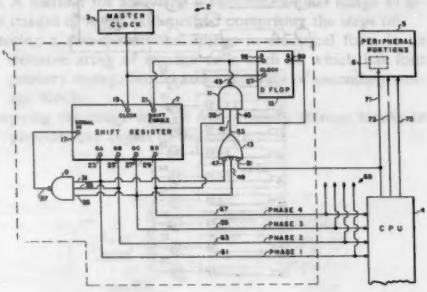
timer means responsive to said detecting means and coupled to said initiating means to terminate said control unit busy signal after a predetermined limited interval, whereby said control unit can attempt for the interval to make a reconnection.

4,191,998

VARIABLE SYMMETRY MULTIPHASE CLOCK GENERATOR

Joseph P. Carmody, Willow Grove, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 29, 1978, Ser. No. 891,076
Int. Cl.[2] G06F *1/04*
U.S. Cl. 364—200 **14 Claims**



1. In clock generator apparatus including a circulating shift register portion having a master clock input connection, a shift enable connection, and a plurality of parallel output connections, said portion, in the presence of a shift enabling signal on said shift enable connection, being responsive to a master clock signal applied to said clock input connection to circulate a logic bit among said output connections under the control of said master clock signal, thereby to produce at each of said output connections a corresponding one of a group of clock phase signals, each of which consists of a series of pulses of widths related to the master clock signal period, the improvement for imparting a desired nonsymmetry to said clock phase signals, comprising

gating means having inputs connected to said output connections to receive said clock phase signals, having an output connected to said shift enable connection, and operative to apply a shift enabling signal to said shift enable connection in the presence of certain of said pulses to terminate the latter, and to suspend said application of said shift enabling signal to said shift enable connection in the presence of others of said pulses to widen the latter, and

bistable means connected to receive said shift enabling signal and connected to said inputs of said gating means to cause the latter to produce said shift enabling signal in each master clock signal period following one in which the application of said shift enabling signal was suspended, thereby to limit the extent of said widening of said other pulses.

4,191,999

SYSTEM OF DISPLAYING TO A CUSTOMER AN AMOUNT OF PAPER MONEY DELIVERED AS A CHANGE

Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

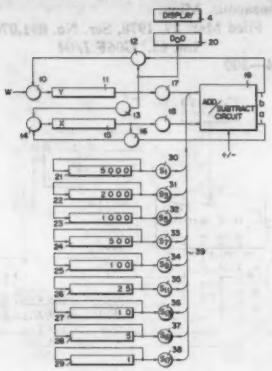
Filed Jul. 11, 1978, Ser. No. 923,499
Claims priority, application Japan, Jul. 15, 1977, 52-84850
Int. Cl.[2] G06F *15/20*
U.S. Cl. 364—405 **2 Claims**

1. In an electronic change circulation and dispensing apparatus for calculating change based upon a sales amount and a tendered money amount, and automatically dispensing coins as part of said change, the improvement comprising a paper money amount displaying system including:

calculating means for calculating said change based upon a sales amount and a tendered money amount;

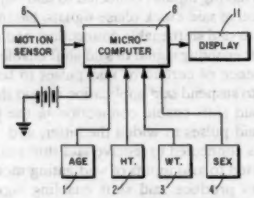
means coupled to said calculating means for converting said

change calculated by said calculating means into the corresponding units of money according to the denominations of the money; and



display means coupled to said converting means for displaying the number of those of said corresponding units of money which are represented at least by paper money.

4,192,000
ELECTRONIC CALORIE COUNTER
Elmer M. Lipsey, McLean, Va., assignor to Calorie Counter Limited Partnership, Springfield, Va.
Filed Jul. 14, 1977, Ser. No. 815,854
Int. Cl.[2] G01L *3/00*
U.S. Cl. 364—415 **5 Claims**



1. An electronic consumption calculator including

(1) an activity sensor having

(a) a housing, a first magnet having a fixed position in said housing

(b) a second magnet movable within said housing and having a pole aligned to confront the same pole on said fixed magnet so that the second magnet occupies a reference position at a distance from said first magnet, and

(c) a means for defining an axis between said first magnet's fixed position and said second magnet's reference position, said axis being intercepted by said second movable magnet in response to activity by a user of said calculator, and

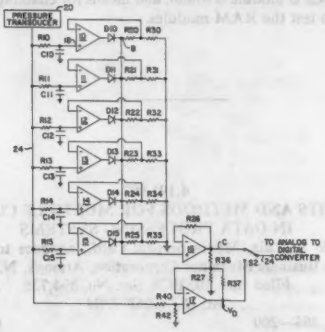
(2) means for calculating the number of calories expended in the course of said activity comprising

(a) means for defining a first variable as a function of the time the second magnet intercepts said axis,

(b) means for deriving a second variable as a function of the physical characteristics of said user including age, sex, height and weight, and

(c) processing means for calculating and displaying the number of calories expended on the basis of said first and second variable.

4,192,001
DECOMPRESSION ASCENT COMPUTER
Francesco Villa, 307 College Ave., Palo Alto, Calif. 94306
Filed Dec. 2, 1977, Ser. No. 856,819
Int. Cl.[2] G06F *15/42*; G06G *7/60*
U.S. Cl. 364—418 **23 Claims**



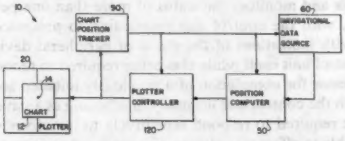
1. A portable decompression ascent computer for underwater use by a diver using a breathing mixture containing an inert gas comprising:

simulating means for generating values representing inert gas partial pressure in at least two body tissues in response to a measured hydrostatic pressure;

scaling means responsive to said simulating means for generating normalized values of said values representing inert gas partial pressure; and

arithmetic means responsive to said scaling means for combining the largest of said normalized values with a quantity proportional to the measured hydrostatic pressure and for generating therefrom indicia of whether a decompression ascent schedule will be required.

4,192,002
APPARATUS AND METHODS FOR POSITION DETERMINING AND PLOTTING
George L. Draper, Camp Springs, Md., assignor to Nav-All, Incorporated, Camp Springs, Md.
Filed Feb. 3, 1978, Ser. No. 875,009
Int. Cl.[2] G06F *15/50*
U.S. Cl. 364—449 **27 Claims**



1. Apparatus for determining the relative location of an observation point with respect to a reference point charted on a map, and for plotting the relative location on the map, the apparatus comprising:

plotter means having indicia means defining a position point and drive means for effecting relative displacement of the map and said position point with respect to each other such that said position point may be aligned with different map locations;

means operable when actuated for determining the distances between three charted reference points which are spaced with respect to each other so as to define a triangle, and such that no two of the charted reference points are colinear with the observation point;

means operable when actuated for determining the included angles defined by said three charted reference points and the observation point;

means responsive to said distance determining and to said angle determining means for mathematically determining the relative location of the observation point with respect to at least one of said three reference points based on said included angles and said distances between said three reference points; and

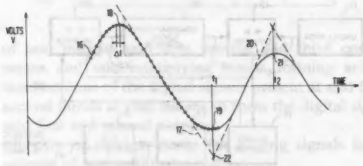
means responsive to said location determining means for controlling said plotter means so as to position the map with respect to said position point such that the map location corresponding to the relative location of the observation point is aligned with said position point.

4,192,003

SIGNAL RECOVERY METHOD AND APPARATUS

George W. Brock; Edward J. Pawlowski, both of Boulder, and Ricardo R. Stone, Eldorado Springs, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 13, 1978, Ser. No. 896,117
Int. Cl.² G06F *15/20*
U.S. Cl. 364—487 **12 Claims**



1. A signal recovery apparatus comprising:

input means for receiving a noisy input signal having a generally sinusoidal waveform but with peaks substantially obliterated by a high level of noise and representative of a desired input signal with clearly identifiable signal peaks;

means for repeatedly measuring successively adjacent slopes of the most linear portions having at least a given minimal linear extent of the noisy input signal between two successive like polarity signal peaks;

determining means receiving said measurement indications for repeatedly determining points of intersection of said most linear portions extrapolated using said measured slopes to identify signal peaks of unlike polarity to and between said two successive like polarity signal peaks; and

means responsive to said determining means for generating the desired input signal using said determined points of intersection.

4,192,004

TOPOLOGICAL TRANSFORMATION SYSTEM

Walter R. Buerger, 20920 Anza Ave., Apt. 4-107, Torrance, Calif. 90503

Filed Sep. 8, 1977, Ser. No. 831,390
Int. Cl.² G06F *15/20*
U.S. Cl. 364—518 **11 Claims**

1. A topological transformation system for transforming and analyzing data distributions residing in topological n-dimensional metric spaces, said system comprising:

transducer means for converting a data distribution in an n-dimensional space into electrical signals;

an iterative array of storage cells, wherein each cell represents one elemental portion of the original space and each cell contains a plurality of storage block pairs which hold pairs of elements of duplicate images;

means for inputting said electrical signals, representative of the original data distribution, to said iterative array;

means for manipulating the contents of said iterative array by simultaneously translating contained duplicate pairs of images of the data distribution in a multiplicity of contravariant or opposing directions along preplanned trajectories in the n-dimensional space, to allow transformation of the data distribution into another form; and,

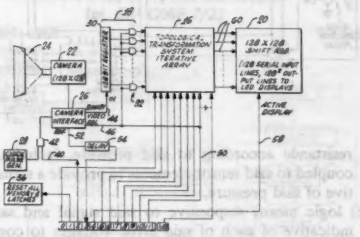
means for comparing the contents of storage block pairs within a cell during translation of the duplicate image pairs, and thereby detecting features relating to forms within or the topology of the original data distribution;

where n is an integer such as 1, 2, 3 or 4.

9. A method for analyzing a two-dimensional image to locate images of holes, said method comprising the steps of:

storing a two-dimensional image in electrical form in an iterative array of storage cells each of which has four primary storage blocks and a plurality of secondary storage blocks;

copying the image into all four primary storage blocks to provide four copies of the image;



shifting the four image copies simultaneously in four respective directions, one cell at a time, by shifting the contents of each primary storage element to its counterpart in the adjacent cell in the direction of shifting;

comparing on each shift the content in each cell of the left- and right-shifted images and of the up- and down- shifted images, to determine overlap or non-overlap of the images;

determining on each such shift and for each cell whether there was a transition from an overlapping to a non-overlapping condition, or vice versa, for both the left- and right-shifted images and the up- and down-shifted images;

recording such transitions in one of said secondary storage blocks to indicate centers of holes in an up/down and a left/right sense;

logically combining the transitions to determine the exact hole centers; and,

displaying the results in a display device.

4,192,005

COMPENSATED PRESSURE TRANSDUCER EMPLOYING DIGITAL PROCESSING TECHNIQUES

Anthony D. Kurtz, Englewood, N.J., assignor to Kulite Semiconductor Products, Inc., Ridgefield, N.J.

Filed Nov. 21, 1977, Ser. No. 853,219
Int. Cl.² G06F *15/20*
U.S. Cl. 364—571 **10 Claims**

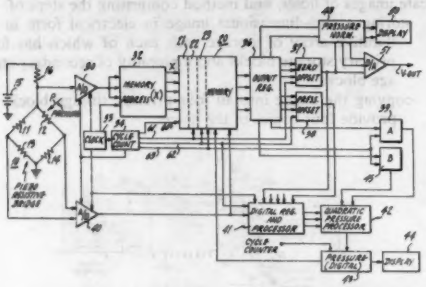
1. A pressure transducer of the type employing semiconductor sensor elements capable of providing a change in resistance according to the magnitude of an applied pressure, said elements when biased, undesirably providing specified error voltages due to variations inherent in said elements as fabricated with a first error voltage indicative of errors due to a predetermined temperature change, a second error voltage due to changes by a reference pressure applied over a given temperature range, and a third error voltage due to a linear incremental pressure level applied to said elements over a predetermined pressure range, comprising:

(a) memory means having stored at predetermined address locations values indicative of said undesired error voltages,

(b) means coupled to said semiconductor elements and responsive to the temperature of operation for generating a code indicative of one of said predetermined memory address locations,

(c) means for applying said code to said memory to access a value indicative of each of said undesired error voltages,

(d) means for applying a pressure to said semiconductor sensor elements to cause the same to provide a change in



resistance according to said pressure, including means coupled to said sensor elements to provide a signal indicative of said pressure,

(e) logic means responsive to said signal and said value indicative of each of said error voltages to compensate said signal sequentially according to the magnitude of each of said values as stored to provide at an output, a compensated signal indicative of said applied pressure and relatively independent of each of said error voltages.

4,192,006

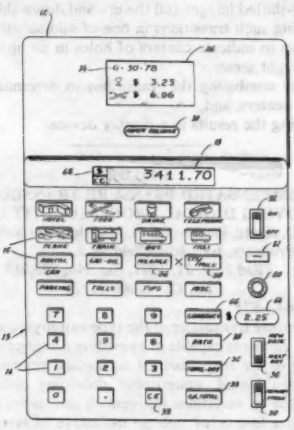
PORTABLE TRAVEL EXPENSE TABULATOR

Harry H. Hausdorff, 270 Westport Rd., Wilton, Conn. 06897

Filed Aug. 7, 1978, Ser. No. 931,363

Int. Cl.[2] G06F *15/30*

U.S. Cl. 364—715 **13 Claims**



1. A portable travel expense tabulator capable of recording, printing and storing records of various expenses commonly incurred on business trips, said tabulator comprising:

a set of numerical input keys, each of said numerical input keys having a numerical representation associated therewith;

a set of expense designating input keys, each of said expense designating input keys having a symbolic travel expense representation associated therewith;

control circuitry responsive to actuation of said numerical input keys and said expense designating input keys;

a recording device including a memory and a printer controlled by said control circuitry for recording and printing numerical inputs from said numerical input keys with associated travel expense representations from said expense designating input keys,

and means associated with said printer for storing printed records,

said control circuitry including means for selectively electrically coupling said numerical input keys and said expense designating input keys to said recording device.

4,192,007

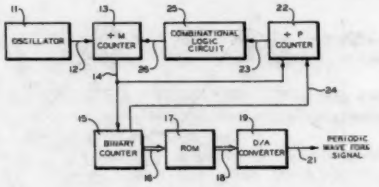
PROGRAMMABLE RINGING GENERATOR

Dustin J. Becker, Rocky River, Ohio, assignor to Lorain Products Corporation, Lorain, Ohio

Filed May 30, 1978, Ser. No. 910,685

Int. Cl.[2] H03B *19/00*; G06F *15/20*

U.S. Cl. 364—721 **24 Claims**



1. In an apparatus for generating a plurality of magnitude values defining a periodic wave form at a predetermined selected frequency the period between predetermined ones of said magnitude values being variable according to a predetermined sequence comprising:

(a) a source of clocking signals generated at a predetermined frequency;

(b) a first counting means responsive to said clocking signals for repetitively counting a first predetermined number of said signals said first counting means generating a first signal when said first predetermined number is counted;

(c) means for storing said plurality of magnitude values, said storage means being responsive to said first signal for generating successive ones of said magnitude values; and

(d) a second counting means responsive to said first signal for repetitively counting a second predetermined number of said first signals, said second predetermined number being the number of times said first counting means counts said first predetermined number of said clocking signals, said second counting means generating upon the occurance of said second predetermined number a count inhibiting signal to said first counting means, said first counting means responsive to said inhibiting signal to inhibit for a predetermined number of clocking signals the counting of said first counting means, whereby the period between predetermined ones of said generated magnitude values is varied according to the predetermined sequence.

4,192,008

WAVE DIGITAL FILTER WITH MULTIPLEXED ARITHMETIC HARDWARE

Gordon J. Mandeville, Lawrence, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 23, 1978, Ser. No. 935,873

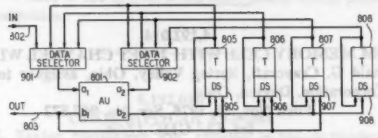
Int. Cl.[2] G06F *15/34*; H03H *7/10*

U.S. Cl. 364—724 **9 Claims**

1. A wave digital filter having minimum arithmetic digital

hardware derived from a symmetric lattice reference filter for filtering input digital samples of a signal comprising:

an arithmetic unit having first and second inputs and first and second outputs, said arithmetic unit including first combining means for digitally combining the signals at said first and second inputs. multiplying means for digitally multiplying by a multiplicand the combined signals from said first and second inputs, second combining means for digitally combining the multiplied combined signals with the signal at said first input to generate a digital signal at said second output, and third combining means for digitally combining the multiplied combined signals with the digital signal at said second input to produce a digital signal at said first output, said multiplying means being adaptively controlled to vary at predetermined instants its multiplicand in a predetermined cyclical manner, at each



of said instants said first, second and third combining means and said multiplying means forming arithmetic combinations of the digital signals present at said first and second inputs at that instant to form the digital signals at said first and second outputs,

a plurality of storage means for storing signals from the outputs of said arithmetic unit;

first selection means for selectively inputting to said inputs of said arithmetic unit in a predetermined cyclical manner at said predetermined instants said input digital samples and the signals stored in said plurality of storage means;

second selection means for selectively inputting to said plurality of storage means in a predetermined cyclical manner at said predetermined instants the signals at said outputs of said arithmetic unit; and

means combining selected outputs of said arithmetic unit to generate digital samples of the filtered input signal.

4,192,009

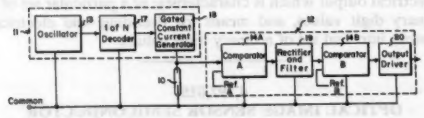
COULOMETRIC DEVICE FOR PERFORMING TIME INTEGRATION

Eugene P. Finger, Brewster, N.Y., assignor to Curtis Instruments, Inc., Mount Kisco, N.Y.

Filed Mar. 10, 1978, Ser. No. 885,279

Int. Cl.² G06G *7/18, 7/161*

U.S. Cl. 364—829 **10 Claims**



6. A coulometric device for integrating a variable with respect to time comprising:

a source of pulsed d.c. current having a variable duty cycle and a substantially constant peak current;

a mercury coulometer to which said pulsed d.c. current is applied;

means for varying said duty cycle substantially in proportion to said variable to be integrated; and

means for detecting a reduction in the voltage drop across said coulometer.

8. A coulometric device for integrating the product of the two variables with respect to time comprising:

a source of pulsed d.c. current having a variable duty cycle and a variable peak current;

a mercury coulometer to which said pulsed d.c. current is applied;

means for varying said duty cycle substantially in proportion to one of said two variables;

means for varying said peak current substantially in proportion to the other of said two variables; and

means for detecting a reduction in the voltage drop across said coulometer.

4,192,010

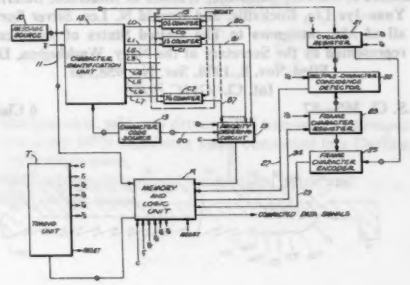
DATA REDUCTION SYSTEM

William R. Kerner, 16186 Rimrock Rd., and Jarred Morton, 19095 Corwin Rd., both of Apple Valley, Calif. 92307

Filed Nov. 28, 1977, Ser. No. 855,484

Int. Cl.² G06F *7/22*

U.S. Cl. 364—900 **9 Claims**



1. A system of data reduction applicable for reducing a sequence of individual characters each of which may have been defined by a code having a predetermined number of bits, comprising:

means for sequentially selecting different sets of said individual characters, controlled by the extent of presence of said characters in said sequence of characters;

means for encoding each of said characters in said sets wherein set characters are distinguished from each other, within a set, by abbreviated codes;

means for developing a first signal component for each of said sets to indicate those positions in said sequence of characters that are occupied by said set characters of a set;

means for developing a second signal component for each of said sets to represent those occurrences of said set characters in said sequence, said second signal component representing said set characters by said abbreviated codes; and

means for providing said signal components for said sets to represent said sequence of characters.

4,192,011

MAGNETIC DOMAIN PACKAGING

Paul V. Cooper, Northampton, and Steven J. Adamson, Towcester, both of England, assignors to Plessey Handel und Investments AG, Zug, Switzerland

Filed Apr. 26, 1978, Ser. No. 900,143

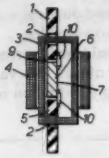
Claims priority, application United Kingdom, Apr. 28, 1977, 17709/77

Int. Cl.² G11C *5/04, 19/08*

U.S. Cl. 365—2 **6 Claims**

1. A magnetic domain device comprising a substrate, a magnetic domain device chip, the chip having an active surface, a pair of coils each having a central axis and each coil extending around the device chip for providing a rotating magnetic field in the plane of the chip, conductive interconnecting means

connecting the device chip to the substrate and arranged to support the device chip so that the active surface is substantially coplanar with a surface of the substrate and with a plane containing the central axes of the coils.

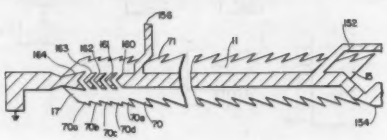


4,192,012

CROSSTIE MEMORY BIT STRETCHER DETECTOR

Leonard J. Schwee, Colesville; Wallace E. Anderson, Beltsville; Yuan-Jye Liu, Rockville, and Ronald N. Lee, Silver Spring, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 8, 1978, Ser. No. 958,913
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—87 6 Claims



1. A circuit for non-destructively detecting the presence and absence of binary information within an area of a shift register of the type suitable for storage and propagation of Bloch line-crosstie pairs, comprising:

a thin-film strip of magnetic material of uniform thickness exhibiting a continuous, stationary domain wall spaced between opposite oblong margins;

an electrical conductor of a substance characterized by a lower resistivity than the magnetic material, deposited upon one surface of the thin-film strip and spaced between the opposite oblong margins; and

the electrical conductor having an open segment formed by a terminal section having edges facing conformal edges of an adjacent terminal section, the edges of each terminal section being symmetrically arranged obliquely about the principal longitudinal axis of the thin-film strip.

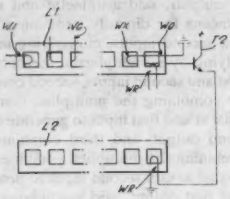
4,192,013

SAFETY CIRCUITS FOR COUPLING LADDICS IN CASCADE

Albert B. Keats, Dorchester, and Dudley W. Leggett, Weymouth, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Continuation of Ser. No. 708,228, Jul. 23, 1976, abandoned. This application Jun. 1, 1978, Ser. No. 911,631
Claims priority, application United Kingdom, Jul. 24, 1975, 31063/75; Dec. 2, 1975, 49445/75
Int. Cl.[2] G11C *11/08*
U.S. Cl. 365—91 2 Claims

2. An electric circuit comprising a first laddic component, a second laddic component, and a coupling circuit for coupling the first and the second laddic components in cascade and including an emitter follower transistor, an output winding of the first laddic component which extends across an end leg of said first laddic component and a leg adjacent said end leg and is connected to the base of said transistor, and a reset winding of the second laddic component connected to the emitter of said transistor such that when the magnetic flux in the first laddic component falls from saturation to remanence reset noise in the coupling circuit is substantially reduced.

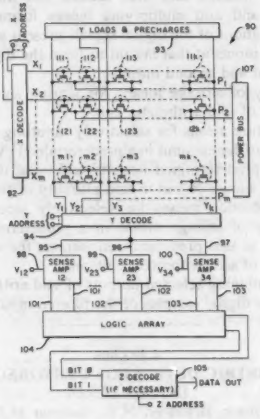


4,192,014

ROM MEMORY CELL WITH 2^n FET CHANNEL WIDTHS

Donald G. Craycraft, Spring Valley, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Nov. 20, 1978, Ser. No. 962,572
Int. Cl.[2] G11C *17/00*
U.S. Cl. 365—104 8 Claims



1. In a read-only memory wherein information storage is provided by a field-effect transistor, the improvement comprising: the transistor channel having a conductance value selected from 2^n possible values ($n>1$) to provide a predetermined electrical output which is characteristic of a particular set of n binary digit values, and means for decoding said electrical output into said set of n binary digit values.

4,192,015

OPTICAL IMAGE SENSOR SEMICONDUCTOR APPARATUS

Michael F. Tompsett, New Providence, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

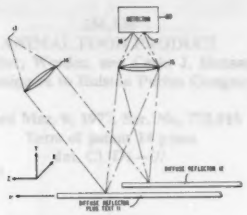
Filed Mar. 6, 1978, Ser. No. 883,476
Int. Cl.[2] G11C *11/42, 13/04*
U.S. Cl. 365—114 10 Claims

8. Semiconductor apparatus which comprises

(a) a first linear array of N substantially identical photoresponsive semiconductor charge storage cells, each cell located in a single crystal semiconductor body at a major surface thereof;

(b) a second linear array of N photoresponsive semiconductor charge storage cells parallel to the first linear array,

each cell of said second array located in said semiconductor body at the major surface thereof, characterized in that



the N cells of the second array have dither coded photosensitivities.

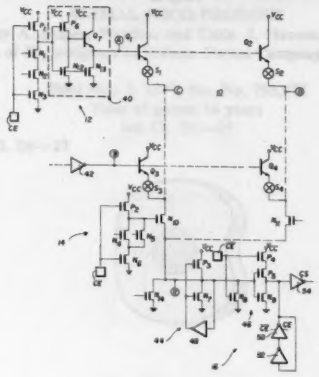
4,192,016

CMOS-BIPOLAR EAROM

David L. Taylor, Melbourne, Fla., assignor to Harris Semiconductor, Melbourne, Fla.

Filed Oct. 20, 1978, Ser. No. 953,316
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—163 **17 Claims**

15. A monolithic electrically alterable memory comprising:
an array of memory cells each including an electrically alterable device and an NPN bipolar transistor in an emitter follower configuration;
row drivers, each including CMOS devices and an NPN bipolar transistor output element in an emitter follower



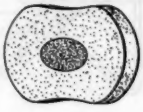
configuration, said row driver NPN transistor and respective array NPN transistors being connected in a Darlington configuration;
CMOS column drivers and transmission gates; and
CMOS output means.

DESIGNS

MARCH 4, 1980

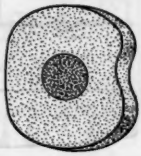
254,336
ANIMAL FOOD PRODUCT
Timothy A. Miller, Worden, and Carlo J. Hansen, Waterloo, both of Ill., assignors to Ralston Purina Company, St. Louis, Mo.
Filed Mar. 9, 1977, Ser. No. 775,815
Term of patent 14 years
Int. Cl. D1—*01*
U.S. Cl. D1—27

254,337
ANIMAL FOOD PRODUCT
Timothy A. Miller, Worden, and Carlo J. Hansen, Waterloo, both of Ill., assignors to Ralston Purina Company, St. Louis, Mo.
Filed Mar. 9, 1977, Ser. No. 775,817
Term of patent 14 years
Int. Cl. D1—*01*
U.S. Cl. D1—27



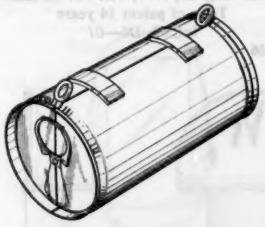
254,338
ANIMAL FOOD PRODUCT
Timothy A. Miller, Worden, and Carlo J. Hansen, Waterloo, both of Ill., assignors to Ralston Purina Company, St. Louis, Mo.
Filed Mar. 9, 1977, Ser. No. 775,818
Term of patent 14 years
Int. Cl. D1—*01*
U.S. Cl. D1—27

254,339
ANIMAL FOOD PRODUCT
Timothy A. Miller, Worden, and Carlo J. Hansen, Waterloo, both of Ill., assignors to Ralston Purina Company, St. Louis, Mo.
Filed May 5, 1977, Ser. No. 793,978
Term of patent 14 years
Int. Cl. D1—*01*
U.S. Cl. D1—27

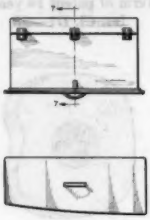


254,340
BELT BUCKLE
Ryk Van Brouwer, Los Angeles, Calif., assignor to Raintree Buckle & Jewelry, Inc., Los Angeles, Calif.
Filed Oct. 28, 1977, Ser. No. 846,624
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—431

254,341
BAG
Anna M. Sacks, 9 David Ave., Glenashley, Durban North, 4051, South Africa
Filed Dec. 1, 1977, Ser. No. 857,352
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—44

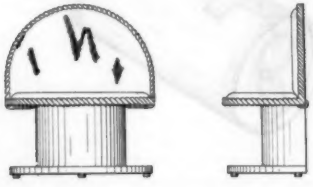


254,342
COLD STORAGE FOOD DRAWER FOR A BOAT OR THE LIKE
Philip C. Sunset, 7735 Quinby Way, Sacramento, Calif. 95816
Filed Feb. 19, 1976, Ser. No. 659,416
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D3—78



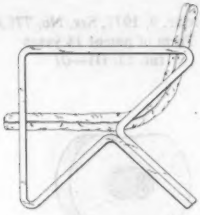
254,343
SADDLE BAGS
Joe J. Babcock, 706 Jerome St., Owosso, Mich. 48867
Filed Jan. 30, 1978, Ser. No. 873,707
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—79

254,344
UPHOLSTERED CHAIR OR THE LIKE
Gregory L. Simmons, 7863 Denham Rd. E., Jacksonville, Fla. 32208
Filed Aug. 29, 1977, Ser. No. 828,556
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—26

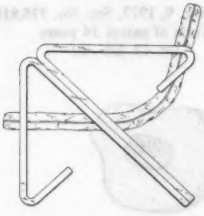


254,345
BOAT SEAT
Andrew Labor, 6501 Fairfield Ave., Shreveport, La. 71106
Filed Oct. 25, 1977, Ser. No. 844,884
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—48

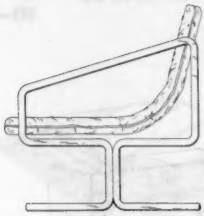
254,346
CHAIR
Steven D. Gageby, 12 Hay Camp Rd., North Oaks, Minn. 55110
Continuation-in-part of Ser. No. 677,623, Apr. 16, 1976. This application Feb. 15, 1978, Ser. No. 878,173
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—56



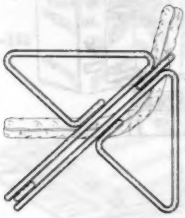
254,347
CHAIR
Steven D. Gageby, 12 Hay Camp Rd., North Oaks, Minn. 55110
Division of Ser. No. 677,630, Apr. 16, 1976, abandoned. This application Feb. 15, 1978, Ser. No. 878,175
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—56



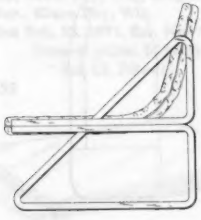
254,348
CHAIR
Steven D. Gageby, 12 Hay Camp Rd., North Oaks, Minn. 55110
Division of Ser. No. 677,627, Apr. 16, 1976. This application Jun. 1, 1978, Ser. No. 911,468
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—67



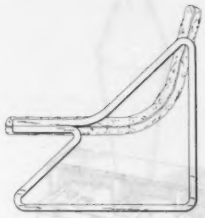
254,349
CHAIR
Steven D. Gageby, 12 Hay Camp Rd., North Oaks, Minn. 55110
Division of Ser. No. 677,619, Apr. 16, 1976. This application Jul. 5, 1978, Ser. No. 922,178
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—67



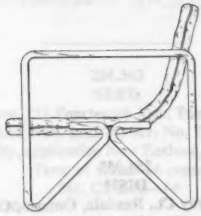
254,350
CHAIR
Steven D. Gageby, 12 Hay Camp Rd., North Oaks, Minn. 55110
Division of Ser. No. 677,626, Apr. 16, 1976. This application Jun. 1, 1978, Ser. No. 911,469
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69



254,351
CHAIR
Steven D. Gageby, 12 Hay Camp Rd., North Oaks, Minn. 55110
Division of Ser. No. 677,626, Apr. 16, 1976. This application Jun. 1, 1978, Ser. No. 911,471
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69

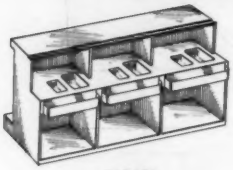


254,352
CHAIR
Steven D. Gageby, 12 Hay Camp Rd., North Oaks, Minn. 55110
Division of Ser. No. 677,747, Apr. 16, 1976. This application Jun. 1, 1978, Ser. No. 911,470
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—73



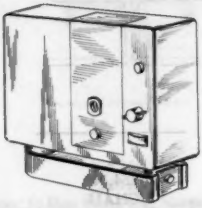
254,353
BATHROOM CABINET
James J. Palka, Arlington Heights, Ill., assignor to General Bathroom Products Corp., Elk Grove Village, Ill.
Filed Nov. 17, 1977, Ser. No. 852,370
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—104

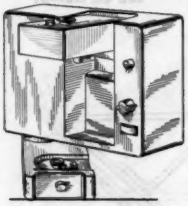
254,354
TRAINING BAR FOR BARTENDERS
Marcia J. McElwee, 283 Fern Dr., Bonaventure, Fort Lauderdale, Fla. 33325
Filed Dec. 5, 1977, Ser. No. 857,878
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—144



254,355
DISH
Sharon Ottier, 15 Wray Ct., Rexdale, Ontario, Canada
Filed Apr. 20, 1978, Ser. No. 898,494
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—20

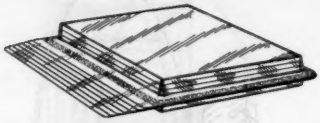
254,356
POWER UNIT FOR KITCHEN APPLIANCES
Karl L. Carlsson, Åtvidaberg, Sweden, assignor to Aktiebolaget Electrolux
Filed Sep. 8, 1977, Ser. No. 831,486
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—153



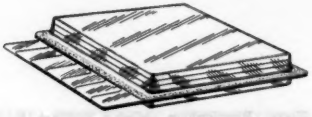


254,357
BOTTLE
Gregory M. Fehn, Maumee, Ohio, assignor to Owens-Illinois Inc., Toledo, Ohio
Filed Oct. 11, 1977, Ser. No. 841,638
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—10

254,358
PACKAGING CONTAINER FOR A SLICED FOOD PRODUCT OR THE LIKE
Theodore P. Seda, Green Bay, Wis., assignor to L. D. Schreiber Cheese Co., Inc., Green Bay, Wis.
Continuation-in-part of Ser. No. 544,906, Jan. 29, 1975, abandoned. This application Feb. 18, 1977, Ser. No. 770,215
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—192



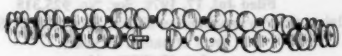
254,359
PACKAGING CONTAINER FOR A SLICED FOOD PRODUCT OR THE LIKE
Theodore P. Seda, Green Bay, Wis., assignor to L. D. Schreiber Cheese Co., Inc., Green Bay, Wis.
Continuation-in-part of Ser. No. 544,907, Jan. 29, 1975, abandoned. This application Feb. 18, 1977, Ser. No. 770,216
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—192



254,360
PACKAGING CONTAINER FOR A SLICED FOOD PRODUCT OR THE LIKE
Theodore P. Seda, Green Bay, Wis., assignor to L. D. Schreiber Cheese Co., Inc., Green Bay, Wis.
Filed Feb. 18, 1977, Ser. No. 770,217
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—192

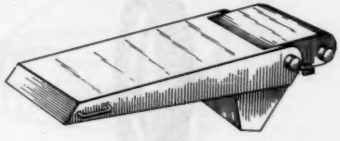
254,361
POPCORN DISPENSER
Earl L. Pitts, 2840 W. 163rd St., Gardena, Calif. 90247
Filed Jul. 11, 1977, Ser. No. 814,156
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—224

254,362
BRACELET OR SIMILAR ARTICLE
Gary E. Minassian, 465 S. Ranchview Cr., #50, Anaheim, Calif. 92807
Filed Oct. 18, 1977, Ser. No. 843,353
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—14



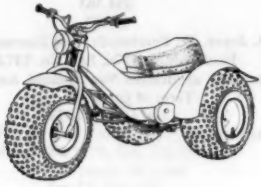
254,363
SLED
Maurice A. Joyce, 231 Fourteenth Ave., Tauranga, New Zealand
Filed Nov. 1, 1976, Ser. No. 737,891
Claims priority, application New Zealand, Aug. 4, 1976, 14626
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—10

254,364
TRAILER LOADING RAMP
Jack E. Moll, New Berlin, Wis., assignor to Miller Tilt-Top Trailer, Inc., Milwaukee, Wis.
Filed Jun. 30, 1977, Ser. No. 812,005
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—53



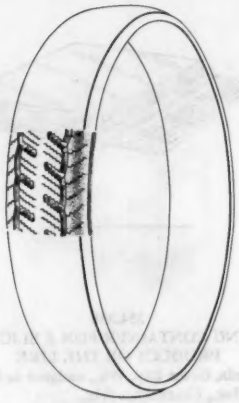
254,365
UNICYCLE FRAME
Frank P. Brilando, Niles, Ill., assignor to Schwinn Bicycle Company, Chicago, Ill.
Filed Feb. 2, 1978, Ser. No. 874,567
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—107

254,366
MOTORTRICYCLE
Kenji Ekuan, Tokyo, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan
Filed Jul. 17, 1978, Ser. No. 925,318
Claims priority, application Japan, Feb. 1, 1978, 53-3324
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—110

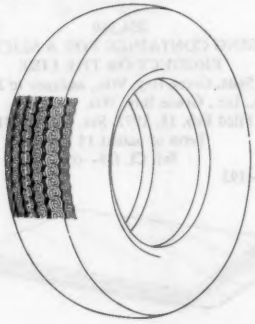


254,367
VEHICLE TIRE
Tadashi Kamiya, Niiza, Japan, assignor to Bridgestone Tire Company Limited, Tokyo, Japan
Filed May 30, 1978, Ser. No. 910,752
Claims priority, application Japan, Nov. 30, 1977, 52-47022
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—136

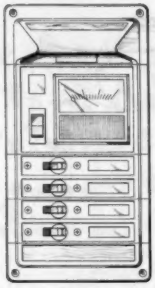
254,368
PNEUMATIC TIRE TREAD AND BUTTRESS
Carl F. Smajd, St. Clair Shores, Mich., assignor to Uniroyal, Inc.
Filed Aug. 14, 1978, Ser. No. 933,390
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—141



254,369
TIRE
Harold D. Fetty, Birmingham, Mich.; William F. Martin, Uniontown, Ohio; Gary A. Tatum, Akron, Ohio, and Lyle L. Worley, Kent, Ohio, assignors to The Goodyear Tire & Rubber Company
Filed Dec. 23, 1977, Ser. No. 863,834
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—142

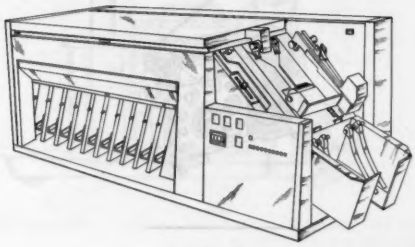


254,370
MODULAR CONTROL PANEL
Barnet Weinstein, 14 Robert Rd., Marblehead, Mass. 01945, and John F. Price, Peabody, Mass., assignors to Barnet Weinstein, Marblehead, Mass.
Filed Apr. 19, 1978, Ser. No. 897,924
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—12

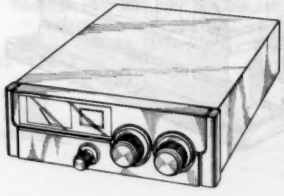


254,371
DATA PROCESSING SYSTEM CONSOLE
Richard L. Boudrot, Framingham; William R. Hall, Norwood, both of Mass., and Allan E. Weaver, Nashua, N.H., assignors to Digital Equipment Corporation, Maynard, Mass.
Filed Mar. 10, 1978, Ser. No. 885,230
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—42

254,372
COLLATING MACHINE
Hans J. Sinn, Stamford; William A. Weirsman, Monroe, and George H. Woods, Fairfield, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.
Filed Oct. 25, 1977, Ser. No. 845,168
Term of patent 14 years
Int. Cl. D14—*02*; D18—*99*
U.S. Cl. D14—48

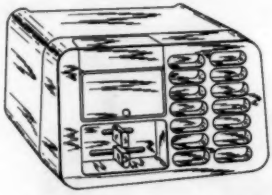


254,373
MOTOR VEHICULAR CITIZENS' BAND TRANSCEIVER
Kikuo Ohta, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Jul. 20, 1977, Ser. No. 817,296
Claims priority, application Japan, Jan. 20, 1977, 52-1477
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68

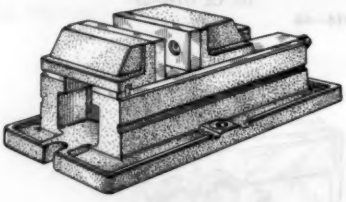


254,374
RADIO RECEIVER
Takeyoshi Kawano, Kyoto, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed May 13, 1977, Ser. No. 796,816
Claims priority, application Japan, Dec. 17, 1976, 51-49314
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—70

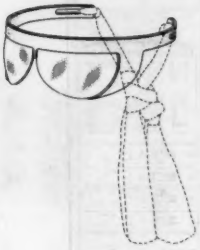
254,375
RADIO
John C. Coons, and Phillip L. Brookshire, both of Cincinnati, Ohio, assignors to Masco Corporation of Indiana
Filed Feb. 14, 1977, Ser. No. 772,509
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—71



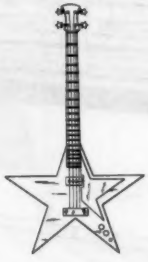
254,376
MACHINE VISE
Frank A. Glomb, Thornton, and William S. Griffith, Chicago, both of Ill., assignors to Chicago Tool and Engineering Company, Chicago, Ill.
Filed Aug. 15, 1977, Ser. No. 824,861
Term of patent 14 years
Int. Cl. D15—*09*; D8—*05*
U.S. Cl. D15—140



254,377
PAIR OF SPECTACLES
Germaine Czerefkow, 1 rue de la Paix, Paris, France
Filed Apr. 18, 1978, Ser. No. 897,461
Term of patent 3½ years
Int. Cl. D16—*06*
U.S. Cl. D16—65

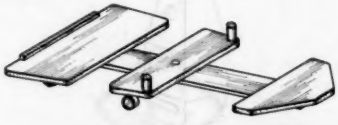


254,378
ELECTRIC GUITAR
John A. Whitesel, II, 7109 Grandview Dr., Indianapolis, Ind. 46202
Filed Aug. 11, 1977, Ser. No. 823,845
Term of patent 7 years
Int. Cl. D17—*03*
U.S. Cl. D17—18

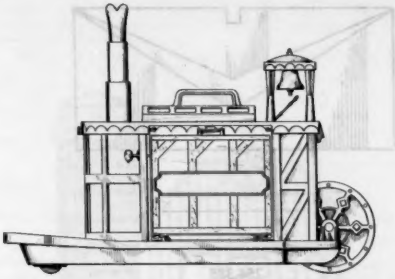


254,379
FONT OF ILLUSTRATION FIGURES FOR CHILDREN'S STORIES AND CARDS
Avis M. Dickey, South Milford, Ind., assignor to Dickey, Inc., South Milford, Ind.
Filed Apr. 18, 1977, Ser. No. 788,676
Term of patent 14 years
Int. Cl. D18—*03*
U.S. Cl. D18—33

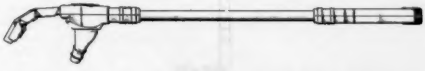
254,380
TOY COASTER
Richard F. Thomas, 1217 Rockhaven Dr., San Jose, Calif. 95120
Filed Nov. 7, 1977, Ser. No. 849,491
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—76



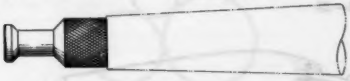
254,381
TOY BOAT
John E. Holden, R.D. #1, Box 304, Mount Joy, Pa. 17552
Filed Mar. 1, 1977, Ser. No. 773,343
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—130



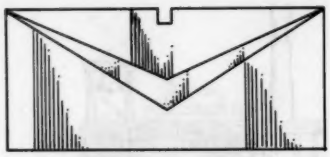
254,382
TOY ROBOT HAND
Toshio Suzuki, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Apr. 4, 1978, Ser. No. 893,523
Claims priority, application Japan, Nov. 29, 1977, 52-47251
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—189



254,383
COMBINED CUE PROTECTOR AND TIP SCUFFER
Richard D. Poliquin, 18951 Newton St., Santa Ana, Calif. 92703
Filed Mar. 20, 1978, Ser. No. 888,110
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—210



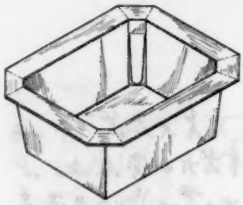
254,384
GOLF CLUB HEAD OR SIMILAR ARTICLE
Edward L. Cicero, 52-62 66 St., Maspeth, N.Y. 11378
Filed Sep. 17, 1976, Ser. No. 724,477
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—219



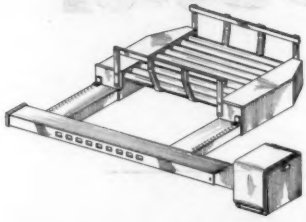
254,385
SKI
Anton Arnsteiner, Mittersill, Austria, assignor to Blizzard Gesellschaft m.b.H., Mittersill, Austria
Filed May 23, 1977, Ser. No. 799,759
Claims priority, application Austria, Nov. 22, 1976, 12498
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—229

254,386
FISHING LURE
William D. Storm, Norman, Okla., assignor to Storm Plastics, Inc., Norman, Okla.
Filed Dec. 12, 1977, Ser. No. 859,659
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—28

254,387
WHIRLPOOL BATHTUB
Philip I. Ogden, 510 E. 46 St., Boise, Id. 83204
Filed Dec. 5, 1977, Ser. No. 857,360
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—55

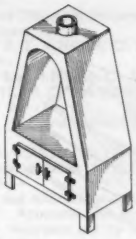


254,388
COMBINED GRATE AND FIREPLACE HEAT EXCHANGER
Amos E. Chesnut, Columbus, and Albert J. Parrigin, Scipio, both of Ind., assignors to Arvin Industries, Inc., Columbus, Ind.
Filed Feb. 21, 1978, Ser. No. 879,099
Term of patent 14 years
Int. Cl. D7—*08;* D23—*03*
U.S. Cl. D23—95

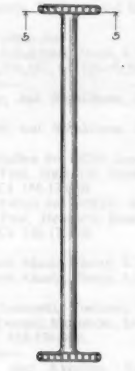


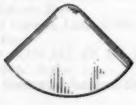
254,389
STOVE
Daryl D. Freeland, 2729 Robinhood Dr., Greensboro, N.C. 27408
Filed Feb. 3, 1978, Ser. No. 874,929
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97

254,390
FIREPLACE UNIT
William T. Smith, 5500 Morrow Way, #88, La Mesa, Calif. 92041
Filed Jul. 27, 1978, Ser. No. 928,848
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97

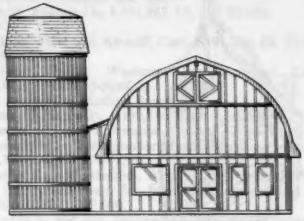


254,391
ROOM HEAT RECIRCULATOR
Lawrence G. Montecalvo, 5845 Shafer Rd., Warren, Ohio 44481
Filed Nov. 2, 1977, Ser. No. 847,728
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—151





254,392
BUILDING
Howard Cooper, Chicago, Ill., assignor to Barn and Silo Stores Inc., Chicago, Ill.
Filed Nov. 18, 1977, Ser. No. 853,633
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—14

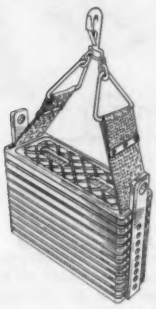


254,393
COMBINED PLANT TRELLIS AND WINDOW GUARD
Richard E. Cone, Kent, Ohio, assignor to Questor Corporation, Toledo, Ohio
Filed Nov. 10, 1977, Ser. No. 850,084
Term of patent 14 years
Int. Cl. D8—*99*; D25—*02*
U.S. Cl. D25—53

254,394
COLLAPSED WEB LADDER

Frank B. Leslie, 8883 Niagara River Pkwy., Niagara Falls, Ontario 6S6, and Alexander S. Kiss, P.O. Box 209, Queenston, Ontario, both of Canada

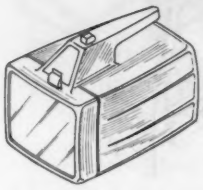
Filed Feb. 21, 1978, Ser. No. 879,690
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D25—64



254,395
FLASHLIGHT

Ronald R. Klawitter, Hermann, Mo., assignor to Steven Manufacturing Company, Hermann, Mo.

Filed Apr. 17, 1978, Ser. No. 896,916
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 R



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 4TH DAY OF MARCH, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A/S Niro Atomizer: *See*—
Christensen, Mogens A.; Hovmand, Svend; Laursen, Jens K.; and Mortensen, Henrik B., 4,190,963, Cl. 34-57.00A.

AB Gustavsberg: *See*—
Teglund, Lars; and Oldani, Melchiorre, 4,190,910, Cl. 4-421.000.

AB Nordstroms Linbanor: *See*—
Wahlstrom, Ake E. T., 4,191,314, Cl. 222-506.000.

AB Volvo Penta: *See*—
Borgersen, Kjell-Idar, 4,191,063, Cl. 74-388.00R.
Pichl, Heinz, 4,191,238, Cl. 164-100.000.

Abbott Laboratories: *See*—
Horrom, Bruce W.; and Barta, William D., 4,191,760, Cl. 424-244.000.
Keeler, Robert J., 4,191,186, Cl. 128-214.400.

Abbott, Tony. Massage apparatus. 4,191,177, Cl. 128-51.000.

Abbruzzese, Carlo: *See*—
Rinelli, Giorgio; and Abbruzzese, Carlo, 4,191,729, Cl. 423-98.000.

Ablaza, Sariel G. G. Apparatus and method for surgical repair of dissecting thoracic aneurysms and the like. 4,190,909, Cl. 3-1.400.

Abramov, Valentin S.: *See*—
Stepantsov, Georgy K.; Abramov, Valentin S.; Bloschitsyn, Jury N.; and Zaripov, Raif R., 4,191,045, Cl. 72-407.000.

Acker, Richard C., to Weatherhead Company, The. Automotive quick connect tube coupling. 4,191,408, Cl. 285-113.000.

Adamson, Steven J.: *See*—
Cooper, Paul V.; and Adamson, Steven J., 4,192,011, Cl. 365-2.000.

Adolf Illig Maschinenbau GmbH & Co.: *See*—
Kiefer, Gunther, 4,191,520, Cl. 425-387.100.

Aeronca, Inc.: *See*—
Mattson, Frank J.; Lawler, John T.; Stegall, Jack L.; and Dawkins, Kenneth R., 4,191,209, Cl. 137-486.000.

Agence Nationale de Valorisation de la Recherche: *See*—
Lehmann, Robert; Lyonnet, Andre; and Rochas, Paul, 4,191,010, Cl. 57-208.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Lecluse, Jean-Francois, 4,191,914, Cl. 318-139.000.

AGFA-Gevaert, A.G.: *See*—
Dolling, Ludvik; Haag, Wilhelm; and Heindze, Herbert, 4,191,213, Cl. 137-625.170.

Aguettaz, Jean: *See*—
Koehler, Gerard; Aguettaz, Jean; Berthelot, Alain; Genter, Claude; and Arnoux, Daniel, 4,191,937, Cl. 335-230.000.

Ahlgren, David W.; Hassell, David A.; and Zimmer, Elvis S., to Paulucci, Jeno F. Food oven. 4,191,881, Cl. 219-388.000.

Air Test Labs, Inc.: *See*—
Jacoby, Marvin; Jacoby, Richard; and Ellson, Robert, 4,191,054, Cl. 73-421.50R.

Aisin Seiki Kabushiki Kaisha: *See*—
Kawata, Shoji; and Sakakibara, Naoji, 4,191,051, Cl. 73-347.000.
Kodama, Hisashi, 4,191,142, Cl. 123-90.580.

Ajinomoto Co., Inc.: *See*—
Nagatsu, Toshiharu; and Sakakibara, Shumpei, 4,191,808, Cl. 435-24.000.
Nagatsu, Toshiharu; and Sakakibara, Shumpei, 4,191,809, Cl. 435-24.000.

Akademie der Wissenschaften der DDR: *See*—
Krumphold, Ralf; Paul, Heinrich; Busalow, Juri; and Kopjew, Iwan, 4,191,597, Cl. 148-12.00B.

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Akashi, Shunji: *See*—
Yoshida, Hiroshi; and Akashi, Shunji, 4,190,944, Cl. 29-408.000.
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Kuroda, Michio; Yamazaki, Yoshiaki; Namura, Kiyoshi; Kato, Fumio; Akatsu, Yasuaki; Morimoto, Daizo; and Ninomiya, Satoshi, 4,191,508, Cl. 416-196.00R.

Akiyama, Yoshinori: *See*—
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Aktiebolaget Hassle: *See*—
Bogentoft, Conny D., 4,191,744, Cl. 424-78.000.

Aktiebolaget Platmanufaktur: *See*—
Hansson, Knut; and Larson, Lars, 4,191,493, Cl. 405-150.000.

Akzona Incorporated: *See*—
Johnson, Claude D., 4,191,125, Cl. 116-219.000.

Albany International Corp.: *See*—
Clark, Richard E.; Skelton, John; and Davis, Robert B., 4,191,218, Cl. 139-383.00R.

Albright, James C.; and Gant, Preston L., to Conoco, Inc. Method for determining residual oil concentration of a formation using thermal neutron decay measurements. 4,191,883, Cl. 250-259.000.

Albright & Wilson Ltd.: *See*—
Mather, Douglas E.; Messenger, Edward T.; and Phillips, Bryn M., 4,191,704, Cl. 260-459.00R.

Alco Electronic Products, Inc.: *See*—
Kirchoff, Francis D., 4,191,387, Cl. 277-30.000.

Alexoff, Carl: *See*—
Goldman, Max; and Alexoff, Carl, 4,191,376, Cl. 273-139.000.

Alfa-Laval AB: *See*—
Stroucken, Klaus; Winberg, Torbjorn; and Lindfors, Kaj, 4,191,325, Cl. 233-20.00A.

All India Institute of Medical Sciences: *See*—
Talwar, Gursaran P., 4,191,746, Cl. 424-92.000.

Allen, James A.; and Torrington, Leslie A., to RCA Corporation. Video disc player having unitary record handling platform construction. 4,191,380, Cl. 274-9.00B.

Allen, James R.; and Hammes, Alvin T., to Research Products Company. Tablet dispenser for fumigating agricultural commodities. 4,191,308, Cl. 221-202.000.

Allen, Peyton S.; and Bell, Norman G. Solar energy converting apparatus. 4,191,168, Cl. 126-441.000.

Alley, Lewis F.; and White, James E., to Marlen Research Corporation. Product portioning in the continuous pumping of plastic materials. 4,191,309, Cl. 222-1.000.

Allied Chemical Corporation: *See*—
Chung, Daniel C.; and Prevorsek, Dusan C., 4,191,790, Cl. 427-164.000.
Hawkins, Edwin F.; and Parham, Thomas M., Jr., 4,191,550, Cl. 71-30.000.
Marshall, Robert M., 4,191,656, Cl. 252-8.600.
Tovrog, Benjamin S.; Diamond, Steven E.; and Mares, Frank, 4,191,696, Cl. 260-348.330.

Allis-Chalmers Corporation: *See*—
Williams, Hugh K., 4,191,273, Cl. 180-89.130.

Allison, C. Jay, Jr.; and Willis, Kirk, to Illinois Tool Works Inc. Injection planting tool. 4,191,116, Cl. 111-4.000.

Alpert, Seymour B.: *See*—
Lebowitz, Howard E.; Wolk, Ronald H.; Alpert, Seymour B.; Stewart, Norman C.; and Rovesti, William C., 4,191,700, Cl. 260-449.00M.

Alternative Pioneering Systems, Inc.: *See*—
Erickson, Chad S., 4,190,965, Cl. 34-196.000.

Aluminum Company of America: *See*—
Kondis, Thomas J., 4,191,557, Cl. 75-0.50A.
Van Linden, Jan H. L.; Miller, Ronald E.; and Herrick, Joseph R., 4,191,559, Cl. 75-68.00R.

American Can Company: *See*—
Wiesman, Dale C., 4,191,673, Cl. 260-29.6XA.

American Cyanamid Company: *See*—
Asato, Goro, 4,191,830, Cl. 546-274.000.
Begala, Arthur J., Jr.; and Kaufman, Ernest D., 4,191,645, Cl. 210-47.000.
Drabb, Thomas W., Jr.; and Lovell, James B., 4,191,768, Cl. 424-251.000.
Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-Mei L., 4,191,699, Cl 260-448.20D.
McGrath, James W., Jr.; and Seifried, Paul E., 4,191,294, Cl. 209-135.000.

American Home Products Corporation: *See*—
Sellstedt, John H.; Guinosso, Charles J.; and Begany, Albert J., 4,191,840, Cl. 562-453.000.

American Hospital Supply Corporation: *See*—
Sopher, Joshua E., 4,191,864, Cl. 179-175.10A.

American Medical Systems, Inc.: *See*—
Bradley, William E.; Timm, Gerald W.; Klatt, William M.; and Graves, Wayne H., 4,191,196, Cl. 128-733.000.

American Optical Corporation: *See*—
Scully, John F., 4,191,468, Cl. 356-17.000.

Amick, David R., to Rohm and Haas Company. Polyamine-crosslinked anion exchange resin. 4,191,814, Cl. 521-32.000.

Amneus, John S.: *See*—
Byrd, Alan E.; Amneus, John S.; Lucas, Malcolm B.; Van Coney, Robert H.; and Van Loan, James E., 4,191,517, Cl. 425-286.000.

AMP Incorporated: *See*—
Kopp, Arthur R., 4,191,897, Cl. 307-234.000.

Ampco-Pittsburgh Corporation: *See*—
Edens, Walter W.; and Ingerson, Quentin F., 4,191,601, Cl. 148-160.000.

Amtmann, Heribert; Ebersberger, Hans; Eckardt, Guenter; and Greiner, Hans-Joachim, to Siemens Aktiengesellschaft. X-ray diag-

nostic generator in which the x-ray tube voltage is regulated via the x-ray tube current. 4,191,891, Cl. 250-402.000.

Analogic Corporation: *See*—
Max, Solomon M.; and Weedon, Hans J., 4,191,929, Cl. 330-10.000.

Anderson, Arthur H.; and Murray, Thomas E. Automatic thermostatic control for a steam trap radiator. 4,191,327, Cl. 236-42.000.

Anderson, Wallace E.: *See*—
Schwee, Leonard J.; Anderson, Wallace E.; Liu, Yuan-Jye; and Lee, Ronald N., 4,192,012, Cl. 365-87.000.

Andersson, Roland J. E.; Larsson, Lars-Ake L.; and Traven, Lars J. C., to Gambro AB. Control apparatus for controlling positioning of a control member. 4,191,359, Cl. 251-9.000.

Ando, Mamoru: *See*—
Fukui, Yoshio; Shiroto, Yoshimi; Ando, Mamoru; and Homma, Yasumasa, 4,191,636, Cl. 208-110.000.

Annovi, Giuseppe, to Calzaturificio Giuseppe Garbuio S.A.S. Lever closure for ski boots. 4,190,970, Cl. 36-50.000.

Antipov, Georgy A.; Gelfand, Mikhail L.; Lavnikov, Nikolai S.; Teres, Leonid N.; Urazhdin, Ivan I.; Tsipenjuk, Yakov I.; and Yakubovsky, Petr S. Impact wrench. 4,191,264, Cl. 173-93.600.

Antwiler, Glen D.: *See*—
Popovich, Robert P.; Antwiler, Glen D.; and Moncrief, Jack W., 4,191,182, Cl. 128-214.00R.

Anzai, Shiro: *See*—
Kataoka, Nobuyuki; Takahashi, Takuya; Ohkawa, Fujio; and Anzai, Shiro, 4,191,671, Cl. 260-23.70M.

Aomura, Kunio; Tokuyoshi, Fujiki; and Nakamae, Masahiko, to Nippon Electric Co., Ltd. Method of manufacturing PN junctions in a semiconductor region to reach an isolation layer without exposing the semiconductor region surface. 4,191,595, Cl. 148-1.500.

Applied Magnetics Corporation: *See*—
Gibson, George W., 4,191,983, Cl. 360-125.000.

Arai, Akihiro: *See*—
Urano, Fumio; Haraguchi, Keisuke; and Arai, Akihiro, 4,191,463, Cl. 354-217.000.

Araoka, Ikuo. Dewatering suction apparatus for paper making machine. 4,191,612, Cl. 162-352.000.

Araseki, Takashi, to Nippon Electric Co., Ltd. Block digital processing system for nonuniformly encoded digital words. 4,191,858, Cl. 179-15.550.

Arcamone, Federico: *See*—
Masi, Paolo; Suarato, Antonino; Bernardi, Luigi; and Arcamone, Federico, 4,191,755, Cl. 424-180.000.
Masi, Paolo; Suarato, Antonino; Bernardi, Luigi; and Arcamone, Federico, 4,191,756, Cl. 424-180.000.

Archer, Wendel E.; Wasserman, Norman; and Yano, Douglas H., to Bell Telephone Laboratories, Incorporated. Twin path reed spring relay construction. 4,191,935, Cl. 335-154.000.

Arditty, Herve; and Hunzinger, Jean-Jacques, to U.S. Philips Corporation. Directional coupling-device for multi-mode optical fibres. 4,191,446, Cl. 350-96.150.

Arlt, Dieter; and Jautelat, Manfred, to Bayer Aktiengesellschaft. Process for the preparation of 1,1-dihalo-4-methyl-1,3-pentadiene compounds. 4,191,712, Cl. 260-654.00D.

Armer, Leon, Jr. Balancing apparatus. 4,191,371, Cl. 272-111.000.

Armistead, John A. Composite building unit, method of producing same. 4,190,995, Cl. 52-309.900.

Armistead, William H.; and Lachman, Irwin M., to Corning Glass Works. Manganese cordierite glass-ceramics. 4,191,583, Cl. 106-39.600.

Armstrong, James B.; and Trimmier, J. Robert, to Sperry Corporation. Method of assembling a contrast enhanced display. 4,191,725, Cl. 264-261.000.

Armstrong, James J., to Texas Instruments Incorporated. Method for facilitating attachment of wires to a motherboard. 4,190,951, Cl. 29-628.000.

Armstrong Store Fixture Corporation: *See*—
Moore, David M., 4,191,299, Cl. 211-184.000.

Arnold, Winfried; and Kubach, Hans, to Robert Bosch GmbH. Safety interlock circuit for an error-signal-controlled servo system. 4,191,913, Cl. 318-563.000.

Arnoux, Daniel: *See*—
Koehler, Gerard; Aguettaz, Jean; Berthelot, Alain; Genter, Claude; and Arnoux, Daniel, 4,191,937, Cl. 335-230.000.

Arrigoni, Virgilio; Ercolani, Dario; and Ferrini, Francesco, to Snamprogetti, S.p.A. Device for detecting the initial settling of the solid phase in solid-liquid suspensions. 4,191,047, Cl. 73-61.400.

Arth, Glen E., deceased: *See*—
Johnston, David B. R.; and Arth, Glen E., deceased, 4,191,759, Cl. 424-242.000.

Arth, Rose B.: *See*—
Johnston, David B. R.; and Arth, Glen E., deceased, 4,191,759, Cl. 424-242.000.

Arvai, Tibor, to "Meci" Materiel Electrique de Controle et Industriel. Sewing machines. 4,191,119, Cl. 112-158.00R.

Asahi Kogaku Kogyo Kaisha: *See*—
Urano, Fumio; Haraguchi, Keisuke; and Arai, Akihiro, 4,191,463, Cl. 354-217.000.

Asato, Goro, to American Cyanamid Company. Substituted tetrahydrobenzothiophenes. 4,191,830, Cl. 546-274.000.

Ashida, Itaru: *See*—
Oishi, Masaaki; Ashida, Itaru; and Suzuki, Tetsuro, 4,191,067, Cl. 74-577.00M.

Ashmun, Raymond V.; Baker, Steven R.; and Damerell, Jerry A., to Caterpillar Tractor Co. Engine mounting base. 4,191,356, Cl. 248-678.000.

Ateliers de la Motobecane, S.A.: *See*—
Jaulmes, Eric, 4,191,138, Cl. 123-73.00R.

Atlas Copco Aktiebolag: *See*—
Schoeps, Knut C., 4,191,282, Cl. 192-0.034.

Atomic Energy of Canada Limited: *See*—
Hammerli, Martin; and Butler, John P., 4,191,626, Cl. 204-266.000.

Atwood Vacuum Machine Company: *See*—
Leonhardt, Robert F., 4,191,353, Cl. 248-425.000.

Auburn, Robert M. Laproscopic trocar. 4,191,191, Cl. 128-347.000.

Audeh, Costandi A.; and Johnson, George C., to Mobil Oil Corporation. Process for deasphalting hydrocarbon oils. 4,191,639, Cl. 208-309.000.

Audet, Norman F.; and Orner, George M., to United States of America, Navy. Dry ice, liquid pulse pump cooling system. 4,191,028, Cl. 62-259.000.

Auguadro, Giuseppe. Two compartment container having push button actuator rod. 4,191,311, Cl. 222-142.600.

August, Daniel A. Rotary energy-transmitting mechanism. 4,191,032, Cl. 64-27.00B.

Ausnit, Steven, to Minigrip, Inc. Integral extruded construction for bags. 4,191,230, Cl. 150-3.000.

Austin, John J., to Champion International Corporation. Hourglass carton. 4,191,289, Cl. 206-45.140.

Austin, Peter W., to Imperial Chemical Industries Limited. Reactive dyestuffs containing the residue of 1-hydroxy-7-amino-8-(3'-amino-2',4'-disulphophenylazo)naphthalene-3,6-disulphonic acid. 4,191,687, Cl. 260-153.000.

Auto Crane Company: *See*—
Hickman, Charles E.; and Denwalt, William C., Jr., 4,191,301, Cl. 212-69.000.

Avibank Mfg., Inc.: *See*—
Duran, John A., 4,191,236, Cl. 151-69.000.

Axen, Udo F., to Upjohn Company, The. 5-Halo PGI compounds. 4,191,824, Cl. 542-429.000.

Aymard, Rene: *See*—
Voituriez, Henry; and Aymard, Rene, 4,191,410, Cl. 285-367.000.

Azuma, Ichiro: *See*—
Yamamura, Yuichi; Azuma, Ichiro; Sugimura, Kazuhisa; Morimoto, Hiroshi; Imada, Isuke; and Watanabe, Masazumi, 4,191,778, Cl. 424-317.000.

Azuma, Masaaki: *See*—
Yonezawa, Kazuya; Kato, Yasushi; Furkawa, Hisao; and Azuma, Masaaki, 4,191,713, Cl. 525-102.000.
Yonezawa, Kazuya; Kato, Yasushi; Furukawa, Hisao; and Azuma, Masaaki, 4,191,714, Cl. 525-102.000.

B.F. Goodrich Company, The: *See*—
Tucker, Harold A., 4,191,833, Cl. 548-378.000.
Tucker, Harold A., 4,191,834, Cl. 548-305.000.

Babcock, Frank H., III: *See*—
Wren, Fred H., Jr.; and Babcock, Frank H., III, 4,190,971, Cl. 36-106.000.

Babcock & Wilcox Company, The: *See*—
Boll, Richard H.; and Lapple, Walter C., 4,191,544, Cl. 55-390.000.

Bachner, Jarmila: *See*—
Camenisch, Hans; and Bachner, Jarmila, 4,191,567, Cl. 430-64.000.

Bacsanyi, Thomas J.: *See*—
Orem, Donald E.; Holmes, Vernon P.; and Bacsanyi, Thomas J., 4,191,055, Cl. 73-462.000.

Bakelite Xylonite Limited: *See*—
Jack, James; and King, Godfrey A., 4,191,719, Cl. 264-41.000.

Baker, Brian, to Imperial Chemical Industries Limited. Purification process. 4,191,616, Cl. 203-44.000.

Baker, Eugene E.; and Carter, Ernest E., Jr., to Halliburton Company. Inflatable packer and method of constructing same. 4,191,383, Cl. 277-1.000.

Baker, Larry W. Automatic wind brace for side roll irrigation system. 4,191,206, Cl. 137-344.000.

Baker, Richard R.; and Bunn, Barry G., to British-American Tobacco Company Limited. Permeability meters. 4,191,046, Cl. 73-38.000.

Baker, Steven R.: *See*—
Ashmun, Raymond V.; Baker, Steven R.; and Damerell, Jerry A., 4,191,356, Cl. 248-678.000.

Baker, William S.: *See*—
Rubin, Laurence A.; and Baker, William S., 4,191,234, Cl. 150-52.00R.

Baliga, Bantval J., to General Electric Company. Liquid phase epitaxial method of making a high power, vertical channel field effect transistor. 4,191,602, Cl. 148-171.000.

Ballantyne, David B., to General Motors Corporation. Corrugated conduit retainer. 4,191,409, Cl. 285-189.000.

Ballard, Henry G. Fireplace water heater. 4,191,163, Cl. 126-132.000.

Bally Manufacturing Corporation: *See*—
Burnside, Walter M., 4,191,377, Cl. 273-143.00R.

Bangor Punta Operations, Inc.: *See*—
Curran, Roger J., 4,191,158, Cl. 124-76.000.

Barkan, Yale. Stone disintegrator. 4,191,189, Cl. 128-328.000.

Barksdale, Lester T. Tail gate step. 4,191,388, Cl. 280-166.000.

Barner, Harold R. Trunk retainer assembly. 4,191,413, Cl. 292-262.000.

Barnett, George D., to Barnett, Haynes & Barnett, International. Prestressed concrete roadway. 4,191,490, Cl. 404-70.000.

Barnett, Haynes & Barnett, International: *See*—
Barnett, George D., 4,191,490, Cl. 404-70.000.

Barnett, Ronald R., to General Motors Corporation. Occupant restraint cushion system. 4,191,392, Cl. 280-740.000.

Barnsbee, Clive D., to Eastman Kodak Company. Apparatus for selectively reclaiming parts from film cartridges. 4,191,201, Cl. 134-104.000.
Barraclough, William F.: *See*—
Harrell, John B.; Barraclough, William F.; and Pederson, Curtis O., 4,191,529, Cl. 432-98.000.
Barrett, George M. Fluid transmission. 4,191,018, Cl. 60-428.000.
Barta, William D.: *See*—
Horrom, Bruce W.; and Barta, William D., 4,191,760, Cl. 424-244.000.
Bartl, Herbert: *See*—
Lindner, Christian; Suling, Carlhans; Bartl, Herbert; Schreckenberg, Manfred; Freitag, Dieter; and Konig, Klaus, 4,191,705, Cl. 260-463.000.
BASF Aktiengesellschaft: *See*—
Grafen, Paul; Kroesche, Henning; Schulz, Bernhard; Paust, Joachim; and Pfohl, Sigberg, 4,191,692, Cl. 260-345.500.
Merger, Franz; Towae, Friedrich; and Penzel, Erich, 4,191,838, Cl. 560-205.000.
BASF Wyandotte Corporation: *See*—
Illers, Karl H.; and Stutz, Herbert, 4,191,818, Cl. 528-44.000.
Langdon, William K., 4,191,820, Cl. 528-405.000.
Baso, Loris. Tension element for a ski boot fastener. 4,190,969, Cl. 36-50.000.
Basset Bretogne Loire-B.B.L.: *See*—
Charron, Francis, 4,190,941, Cl. 29-156.70C.
Basso, Michael J.; and Brown, Henry B., to United States of America, Army. Radiation dose rate indicator. 4,191,886, Cl. 250-376.000.
Batha, Howard D.; Mason, John H.; and Thompson, Stanley R., to Carborundum Company, The. Method of removing nitrogen oxides from exhaust gas mixtures. 4,191,730, Cl. 423-239.000.
Battelle Memorial Institute: *See*—
Columberg, Alfred, 4,191,816, Cl. 526-124.000.
Baudier, Claude P.: *See*—
Teysseyre, Pierre M.; and Baudier, Claude P., 4,191,510, Cl. 416-230.000.
Bauer Bros. Co., The: *See*—
Lyons, William E.; and Egan, John J., 4,191,338, Cl. 241-245.000.
Bauermann, Julius F., to Horace W. Longacre, Inc. Process for preparing a pasteurized meat-containing salad. 4,191,787, Cl. 426-615.000.
Baughman, Kenneth E.; and Doyle, Earl N. Apparatus and method for plugging voids in a ground stratum. 4,191,254, Cl. 166-286.000.
Bauman, Claire. Vehicle parking signaling device. 4,191,939, Cl. 340-107.000.
Baumgartner, Paul A. Motorcycle carrier. 4,191,316, Cl. 224-42.03B.
Baxter Travenol Laboratories, Inc.: *See*—
Rubin, Laurence A.; and Baker, William S., 4,191,234, Cl. 150-52.00R.
Winchell, David A.; Martin, Jerry D.; and Roe, Frank L., 4,191,231, Cl. 150-8.000.
Bayer Aktiengesellschaft: *See*—
Arlt, Dieter; and Jautelat, Manfred, 4,191,712, Cl. 260-654.00D.
Lenthe, Manfred; and Schwarz, Hans-Helmut, 4,191,711, Cl. 260-650.00R.
Lindner, Christian; Suling, Carlhans; Bartl, Herbert; Schreckenberg, Manfred; Freitag, Dieter; and Konig, Klaus, 4,191,705, Cl. 260-463.000.
Meyer, Rolf-Volker; Dhein, Rolf; Schneider, Kurt; and Fahnler, Friedrich, 4,191,819, Cl. 528-315.000.
Bearce, Wendell E. Dryer. 4,191,530, Cl. 432-107.000.
Beard, Colin C., to Syntex (U.S.A.) Inc. 5(6)-Benzene ring substituted benzimidazole-2-carbamate derivatives having anthelmintic activity. 4,191,764, Cl. 424-248.550.
Beaver, Danny D.: *See*—
Wendt, Michael E.; and Beaver, Danny D., 4,191,245, Cl. 165-69.000.
Becerra Novoa, Jorge: *See*—
Rodriguez, Federico A.; Becerra Novoa, Jorge; and Sanchez Ramirez, Julian, 4,191,885, Cl. 250-302.000.
Becker, Dustin J., to Lorain Products Corporation. Programmable ringing generator. 4,192,007, Cl. 364-721.000.
Becker, Robert F. Gas-bag supported structural foundation. 4,191,496, Cl. 405-229.000.
Bedel, Denis E., to Westinghouse Electric Corp. Manually operable switch. 4,191,874, Cl. 200-339.000.
Beeftink, Maarten C.; and Helgers, Manfred, to U.S. Philips Corporation. Arrangement for adjusting headlights. 4,191,990, Cl. 362-276.000.
Begala, Arthur J., Jr.; and Kaufman, Ernest D., to American Cyanamid Company. Process for dewatering sewage sludge. 4,191,645, Cl. 210-47.000.
Begany, Albert J.: *See*—
Sellstedt, John H.; Guinosso, Charles J.; and Begany, Albert J., 4,191,840, Cl. 562-453.000.
Beghi, Rene; Desmars, Gabriel; Monie, Yvan; and Pessayre, Raymond. Hoisting device for high-power crane. 4,191,300, Cl. 212-41.000.
Behringwerke Aktiengesellschaft: *See*—
Bohn, Hans; and Stutzinger, Ferdinand, 4,191,533, Cl. 23-230.00B.
Beisner, Robert W.: *See*—
Moyer, Charles E., Jr.; Keller, George E., II; Beisner, Robert W.; and Walker, Wellington E., 4,191,701, Cl. 260-450.000.
Beiter, Charles B.; and Hafner, Leroy A., to M&T Chemicals Inc. Stable dispersions containing trialkyltin fluorides. 4,191,580, Cl. 106-16.000.
Belart, Juan; and Kircher, Dieter, to ITT Industries, Incorporated. Apparatus for braking systems incorporating a pressure-control device for antiskid control. 4,191,210, Cl. 137-505.130.
Belco Pollution Control Corporation: *See*—
Lembo, Michael J.; and Chen, James Y., 4,191,644, Cl. 210-33.000.
Bell, Norman G.: *See*—
Allen, Peyton S.; and Bell, Norman G., 4,191,168, Cl. 126-441.000.
Bell Telephone Laboratories, Incorporated: *See*—
Archer, Wendel E.; Wasserman, Norman; and Yano, Douglas H., 4,191,935, Cl. 335-154.000.
Beni, Gerardo; Gottesfeld, Shimshon; McIntyre, James D. E.; and Shay, Joseph L., 4,191,453, Cl. 350-357.000.
Brown, John F.; and Stanton, Robert M., 4,191,789, Cl. 427-97.000.
Farrow, Cecil W., 4,191,995, Cl. 364-113.000.
Holtzman, Kenneth A., 4,191,800, Cl. 428-251.000.
MacChesney, John B.; O'Connor, Paul B.; and Pearson, Arthur D., 4,191,545, Cl. 65-3.00A.
Mandeville, Gordon J., 4,192,008, Cl. 364-724.000.
Schramm, Eugene C., 4,191,440, Cl. 339-17.00C.
Tompsett, Michael F., 4,192,015, Cl. 365-114.000.
Weber, Roy P., 4,191,860, Cl. 179-18.00B.
Witsenhausen, Hans S.; and Wyner, Aaron D., 4,191,970, Cl. 358-167.000.
Belt, Kenneth W.; and McCarrell, Stuart G., to Macan Engineering & Manufacturing Company, Inc. Variable crest factor high frequency generator apparatus. 4,191,188, Cl. 128-303.130.
Ben-Gurion University of the Negev: *See*—
Branover, Herman, 4,191,901, Cl. 310-11.000.
Bender, Hans; Schnabel, Georg; Duren, Gottfried; and Zabel, Wolf, to Klockner-Humboldt-Deutz. Method and apparatus for cleaning a matrix of a magnetic separator. 4,191,591, Cl. 134-25.00R.
Bendix Corporation, The: *See*—
Kasselmann, John T., 4,191,394, Cl. 280-432.000.
Reitz, Richard J.; and Kruke, Edward J., 4,191,429, Cl. 303-58.000.
Taplin, Lael B., 4,191,146, Cl. 123-117.00R.
Beni, Gerardo; Gottesfeld, Shimshon; McIntyre, James D. E.; and Shay, Joseph L., to Bell Telephone Laboratories, Incorporated. Iridium oxide based electrochromic devices. 4,191,453, Cl. 350-357.000.
Benier B.V.: *See*—
Benier, Johan, 4,191,519, Cl. 425-332.000.
Benier, Johan, to Benier B.V. Dough-rounding machine. 4,191,519, Cl. 425-332.000.
Benjamin, Benjamin C., to Schmelzer Corporation. Time delay assembly. 4,191,096, Cl. 92-143.000.
Benjamin, Robert N.: *See*—
Gleasman, Vernon E.; and Benjamin, Robert N., 4,191,071, Cl. 74-715.000.
Benzinger, Theodor H. Touch free tympanic thermometer. 4,191,197, Cl. 128-736.000.
Berger Jenson & Nicholson Ltd.: *See*—
Salome, Frederik; and Elliott, William T., 4,191,672, Cl. 260-29.6PM.
Salome, Frederik; and Elliott, William T., 4,191,672, Cl. 260-29.6PM.
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Bernardi, Luigi: *See*—
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Berner, John M., to Garven, David H., a part interest. Snow remover. 4,190,972, Cl. 37-43.00D.
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Bernhardt, Jost; Hase, Georg; Hase, Peter; and Hagen, Klaus, 4,191,310, Cl. 222-5.000.
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Berry, David, to BP Chemicals Limited. Cementitious compositions. 4,191,584, Cl. 106-90.000.
Berthelot, Alain: *See*—
Koehler, Gerard; Aguettaz, Jean; Berthelot, Alain; Genter, Claude; and Arnoux, Daniel, 4,191,937, Cl. 335-230.000.
Betz Laboratories, Inc.: *See*—
Quinn, John E.; Wittenbrook, Lawrence S.; and Donegan, Charles E., 4,191,655, Cl. 252-60.000.
Beugelsdyk, Anthony F.: *See*—
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BFG Glassgroup: *See*—
Nolte, Hans-Henning, 4,191,805, Cl. 428-539.000.
BICC Limited: *See*—
Dean, Noel S.; Lawton, Kenneth L.; and Yates, Vincent A., 4,191,448, Cl. 350-96.230.
Bickerton, Harry, to Harry Bickerton Limited. Securement arrangement for bicycle bearing assembly. 4,191,488, Cl. 403-370.000.
Biermann, Peter; and Ewald, Otto, to Vereinigte Baubeschlagfabriken Gretsch and Company GmbH. Cross country ski binding. 4,191,396, Cl. 280-615.000.
Birt, Isobel J. Bed clothing support. 4,190,915, Cl. 5-505.000.

Biter, William J.: *See*—
Shirland, Fred A.; and Biter, William J., 4,191,794, Cl. 427-74.000.

Bivens, Jon A.; and Cochran, Wilson V., to Toro Company, The. Stream reversing director. 4,191,331, Cl. 239-231.000.

Bjornson, Geir, to Phillips Petroleum Company. Hydrodealkylation process and catalyst. 4,191,844, Cl. 568-805.000.

Blake, William S.; and Hammett, Roy, to James D. Pauls and J. Claybrook Lewis and Associates, Limited. Trigger operated dispenser with means for obtaining continuous or intermittent discharge. 4,191,313, Cl. 222-335.000.

Blessing, Hubert, to Levi Strauss & Co. Automatic stitching pattern control system and method for a sewing machine. 4,191,118, Cl. 112-121.110.

Bloch, Christopher D.: *See*—
Goldberg, Jerome; and Bloch, Christopher D., 4,191,274, Cl. 180-282.000.

Bloom, Stanley M.; Borror, Alan L.; and Foley, James W., to Polaroid Corporation. Benzisothiazole-1,1-dioxide and naphtho-1,2-thiazine-1,1-dioxide compounds. 4,191,689, Cl. 548-207.000.

Bloschitsyn, Jury N.: *See*—
Stepantsov, Georgy K.; Abramov, Valentin S.; Bloschitsyn, Jury N.; and Zaripov, Raif R., 4,191,045, Cl. 72-407.000.

Blumle, Leo J.: *See*—
O'Neal, Charles D., III; Blumle, Leo J.; and Hablanian, Marsbed, 4,191,512, Cl. 417-54.000.

Boase, Elmer E.; DiFrancesco, Alphonse B.; and Ring, Stuart F., to Eastman Kodak Company. Apparatus for producing simplex of duplex copies. 4,191,465, Cl. 355-3.0SH.

Bocharov, Jury A.: *See*—
Grigorenko, Anatoly S.; Moroz, Jury A.; Kortusov, Leonid I.; Bocharov, Jury A.; and Safonov, Anatoly V., 4,191,044, Cl. 72-354.000.

Bock, Horst: *See*—
Ehrlinger, Friedrich J.; and Bock, Horst, 4,191,072, Cl. 74-732.000.

Bodenseewerk Perkin-Elmer & Co., GmbH: *See*—
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Boehringer Ingelheim GmbH: *See*—
Nicki, Josef; Muller, Erich; Narr, Berthold; Haarmann, Walter; Schroter, Wolfgang; and Kadatz, Rudolf, 4,191,776, Cl. 424-308.000.

Boehringer Mannheim GmbH: *See*—
Woog, Heinrich; and Gruber, Werner, 4,191,772, Cl. 424-273.00R.

Bogentoft, Conny D., to Aktiebolaget Hassle. Neutralizing agent. 4,191,744, Cl. 424-78.000.

Boggum, Paul; and Schulte, Klaus, to Didier-Werke A.G. Tank block. 4,191,528, Cl. 432-248.000.

Bohn, Hans; and Stutzinger, Ferdinand, to Behringwerke Aktiengesellschaft. Pregnancy-specific β_1-glycoprotein and process for isolating it. 4,191,533, Cl. 23-230.00B.

Boll, Richard H.; and Lapple, Walter C., to Babcock & Wilcox Company, The. Gas cleaning apparatus. 4,191,544, Cl. 55-390.000.

Bolli, Hilda: *See*—
Trouillard, Charles, 4,191,527, Cl. 432-72.000.

Bollmer, Jacob A.; Stearns, Joseph E.; and Brooks, Alvin R., Jr., to Dayco Corporation. Rotary anvil construction. 4,191,076, Cl. 83-13.000.

Bolth, Franklin A.: *See*—
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Bontrager, Kenneth L.; Bontrager, Marion R.; Taylor, Robert J.; and Card, David C., to Diamond Insulation Industries, Inc. Apparatus for making cellulose insulation. 4,191,224, Cl. 141-100.000.

Bontrager, Marion R.: *See*—
Bontrager, Kenneth L.; Bontrager, Marion R.; Taylor, Robert J.; and Card, David C., 4,191,224, Cl. 141-100.000.

Boren, Charles F. Rotary cultivator and mulcher. 4,191,259, Cl. 172-43.000.

Borg-Warner Corporation: *See*—
Thelander, W. Vincent, Sr.; and Lindquist, Terry K., 4,191,285, Cl. 192-111.00A.

Borgersen, Kjell-Idar, to AB Volvo Penta. Servo device, especially for reversible gears in motorboats. 4,191,063, Cl. 74-388.00R.

Borror, Alan L.: *See*—
Bloom, Stanley M.; Borror, Alan L.; and Foley, James W., 4,191,689, Cl. 548-207.000.

Borsuk, Lealie M., to International Telephone and Telegraph Corporation. Fiber optic termination and method of making same. 4,191,447, Cl. 350-96.200.

Bosch, Erhard: *See*—
Schiller, August; Louis, Eckhart; Bosch, Erhard; and Braunsperger, Karl, 4,191,817, Cl. 528-38.000.

Bose, Tejandra N.: *See*—
Patel, Harshad H.; and Bose, Tejandra N., 4,191,148, Cl. 123-119.0CD.

Bosse-Platiere, Michel J., to Schlumberger Technology Corporation. Well bore perforating apparatus. 4,191,265, Cl. 175-4.560.

Bosso, Joseph F.: *See*—
Wismer, Marco; and Bosso, Joseph F., 4,191,674, Cl. 260-29.2EP.

Bostic, Joseph M. Fuel log and method of making it. 4,191,534, Cl. 44-6.000.

Bouchard, Andre C.; Morris, James C.; and Garrison, Robert L., to GTE Sylvania Incorporated. Intrusion alarm system. 4,191,947, Cl. 340-531.000.

Bourgeois, Leonard. Powder transfer system. 4,191,223, Cl. 141-18.000.

Bourne, Percy V., to Calcimatic International Limited. Discharge chute assembly for calcining hearth. 4,191,531, Cl. 432-239.000.

Bowditch, Philip N.; Dahlen, John M.; McKenna, John F., Jr.; Shillingford, John T., Jr.; Siraco, Frank J.; and Toth, William E., to Charles Stark Draper Laboratory, Inc., The. System for measuring ocean current. 4,191,049, Cl. 73-170.00A.

Boyer, Hugh J., to Fieldcrest Mills, Inc. Sheeting fabric formed of corespun yarns. 4,191,221, Cl. 139-426.00R.

Boyko, Michael. Solar chemical process for sludge treatment. 4,191,549, Cl. 71-13.000.

BP Chemicals Limited: *See*—
Berry, David, 4,191,584, Cl. 106-90.000.

Braatz, Paul O.; Grinberg, Jan; Jacobson, Alexander D.; and Waldner, Michael, to Hughes Aircraft Company. Continuous silicon MOS AC light valve substrate. 4,191,454, Cl. 350-342.000.

Braatz, Paul O.: *See*—
Grinberg, Jan; Braatz, Paul O.; Waldner, Michael; and Jacobson, Alexander D., 4,191,452, Cl. 350-342.000.

Bradbury, Christopher G., to Leesona Corporation. Sheet shaping method. 4,191,039, Cl. 72-60.000.

Bradley, Robert A., to Tru-Spoke, Inc. Simulated knock off spinner nut. 4,191,427, Cl. 301-108.00S.

Bradley, William E.; Timm, Gerald W.; Klatt, William M.; and Graves, Wayne H., to American Medical Systems, Inc. Profilometry method and apparatus. 4,191,196, Cl. 128-733.000.

Brannegan, Daniel P.: *See*—
Brennan, Thomas M.; Brannegan, Daniel P.; Weeks, Paul D.; and Kuhla, Donald E., 4,191,693, Cl. 260-345.90R.

Branover, Herman, to Ben-Gurion University of the Negev. Method and system for converting solar energy into electricity. 4,191,901, Cl. 310-11.000.

Bratt, Jan C.; Moodysson, Bengt-Ove M.; and Rosenqvist, Nils K. G., to Kommanditbolaget United Stirling (Sweden) AB & Co. Double-acting hot gas engine assemblage. 4,191,019, Cl. 60-525.000.

Bratton, David: *See*—
Fermi, Rudy; Pickard, John; Kocsis, Alex; Bratton, David; and Kasner, Gerald, 4,191,106, Cl. 101-415.100.

Brauer, Hans; and Demny, Werner, to Friedrich Kocks GMBH & Company. Rolling mills. 4,191,041, Cl. 72-235.000.

Braun, William A., to Data General Corporation. Circuit indicating phase relationship. 4,191,976, Cl. 360-51.000.

Braunsperger, Karl: *See*—
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Brennan, Thomas M.; Brannegan, Daniel P.; Weeks, Paul D.; and Kuhla, Donald E., to Pfizer, Inc. Preparation of gamma-pyrones from 3-substituted furans. 4,191,693, Cl. 260-345.90R.

Brennan, Timothy E., to Wing Industries, Inc. Energy exchange wheel and method of fabrication. 4,191,241, Cl. 165-10.000.

Brenner, William C.; and Sterrett, Charles C., to Westinghouse Electric Corp. Dynamoelectric machine with air gap armature winding. 4,191,903, Cl. 310-213.000.

Brent, Robert G., to Textron, Inc. Polarity control valve. 4,191,202, Cl. 137-112.000.

Bretone, John, Jr. Pipe coupling for plumbing apparatus. 4,191,407, Cl. 285-56.000.

Briand, Marcel E.; and Pannetier, Georges A. Video composite transmission system integrating encoded data channels into blanking and synchronizing signal. 4,191,969, Cl. 358-145.000.

Bridgestone Tire Company, Limited: *See*—
Kadono, Mamoru; Saigusa, Tetsuji; Nakajima, Yoshiyuki; and Koga, Tomohiro, 4,191,217, Cl. 138-109.000.
Kataoka, Nobuyuki; Takahashi, Takuya; Ohkawa, Fujio; and Anzai, Shiro, 4,191,671, Cl. 260-23.70M.

British-American Tobacco Company Limited: *See*—
Baker, Richard R.; and Bunn, Barry G., 4,191,046, Cl. 73-38.000.

British Petroleum Company Limited, The: *See*—
Buckley, Peter S.; and Grist, Dennis M., 4,191,252, Cl. 166-272.000.

British Steam Specialties Limited, The: *See*—
Walker, Robert M., 4,191,211, Cl. 137-512.150.

Brock, George W.; Pawlowski, Edward J.; and Stone, Ricardo R., to International Business Machines Corporation. Signal recovery method and apparatus. 4,192,003, Cl. 364-487.000.

Brook, Neil R.; and Maling, Peter J., to PYE (Electronic Products) Limited. Automatic transport mechanism and a carrier member for use therewith. 4,191,287, Cl. 198-472.000.

Brookhyser, Byron B., to Weyerhaeuser Company. Apparatus for feeding thin sheets. 4,191,368, Cl. 271-10.000.

Brooks, Alvin R., Jr.: *See*—
Bollmer, Jacob A.; Stearns, Joseph E.; and Brooks, Alvin R., Jr., 4,191,076, Cl. 83-13.000.

Broudy, Charles E., to Hart Schaffner & Marx. Railing display rack. 4,191,298, Cl. 211-126.000.

Brown, Henry B.: *See*—
Basso, Michael J.; and Brown, Henry B., 4,191,886, Cl. 250-376.000.

Brown, Jim W. Process for recovering magnetite from fly ash. 4,191,336, Cl. 241-21.000.

Brown, John F.; and Stanton, Robert M., to Bell Telephone Laboratories, Incorporated. Fabrication of bi-level circuits. 4,191,789, Cl. 427-97.000.

Brown, Karl L., to Varian Associates, Inc. Magnetic beam deflection system free of chromatic and geometric aberrations of second order. 4,191,887, Cl. 250-396.0ML.

Brown, Robert J., to Dana Corporation. Self lubricating one way coupling. 4,191,279, Cl. 188-82.840.

Brown, Ronald W. Dental organizer and container. 4,191,291, Cl. 206-369.000.

Brown & Sharpe Manufacturing Company: *See*—
Vanslette, Robert A., 4,191,059, Cl. 74-25.000.
Brown, Wayne R.; Jones, John E.; and Sherrill, Charles F., to Disston, Inc. Battery pack rechargeable in recessed or flush-type receptacles. 4,191,917, Cl. 320-2.000.
Brown & Williamson Tobacco Corporation: *See*—
Sullivan, James W., 4,191,199, Cl. 131-96.000.
Bruce Plastics, Inc.: *See*—
Szabo, Bela G., 4,191,232, Cl. 150-12.000.
Brugger, Wilhelm, to Th. Goldschmidt AG. Method for the separation of a mixture of fine particles. 4,191,727, Cl. 423-1.000.
Brunetti, Heimo; Rody, Jean; Soma, Nobuo; and Kurumada, Tomoyuki, to Ciba-Geigy Corporation; and Sankyo Company Limited. Derivatives of 4-aminopiperidine as stabilizers for polymers. 4,191,683, Cl. 260-45.80N.
Brunnett, Carl J.: *See*—
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Bryant, Bernard J. Method and material for increasing the percentage of mammalian offspring of either sex. 4,191,749, Cl. 424-105.000.
Buckley, Peter S.; and Grist, Dennis M., to British Petroleum Company Limited, The. Method for the recovery of oil. 4,191,252, Cl. 166-272.000.
Buerger, Walter R. Topological transformation system. 4,192,004, Cl. 364-518.000.
Buescher, William E.; Roberto, Frederick J.; and Sobierajski, Isabelle M., to GTE Sylvania Incorporated. Brazing slurry. 4,191,577, Cl. 106-1.120.
Bulanda, John J.; and Lopata, John E., to Panduit Corp. Cable tie. 4,191,334, Cl. 24-16.0PB.
Bundy, Gordon L., to Upjohn Company, The. 2-Decarboxy-2-aminomethyl-9-deoxy-9-methylene-16-phenyl-PGF compounds. 4,191,707, Cl. 260-570.5CA.
Bundy, Gordon L., to Upjohn Company, The. Trans-2,3,13,14-tetradehydro-9-deoxy-9-methylene-ω-aryl-PGF compounds. 4,191,837, Cl. 560-55.000.
Bunn, Barry G.: *See*—
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Large, George B.; and Buren, Lawrence, 4,191,552, Cl. 71-86.000.
Burford, Roy T. Shoe cleaning device. 4,190,919, Cl. 15-4.000.
Burkwall, Morris P., Jr.; and Gould, Penelope L., to Quaker Oats Company, The. Shelf stable, high moisture food and process. 4,191,783, Cl. 426-335.000.
Burnside, Walter M., to Bally Manufacturing Corporation. Indexing means for rotating drums of amusement apparatus. 4,191,377, Cl. 273-143.00R.
Burri, Peter, to Ciba-Geigy Corporation. Substituted 3,6-diaminophthalides. 4,191,690, Cl. 260-343.30R.
Burroughs Corporation: *See*—
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Krumphold, Ralf; Paul, Heinrich; Busalow, Juri; and Kopjew, Iwan, 4,191,597, Cl. 148-12.00B.
Bussard, Charles B.; and Jenkins, William A., to Monarch Marking System, Inc. Hand-held labeler. 4,191,608, Cl. 156-584.000.
Busta, Heinz H., to Gould Inc. Inversion layer sprain gauge. 4,191,057, Cl. 73-777.000.
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Butter, Charles D., to Honeywell Inc. Laser-fiber optic interferometric strain gauge. 4,191,470, Cl. 356-35.500.
B.V. Machinefabriek Breda v/h Backer & Rueb: *See*—
Versteeg, Jacobus C., 4,191,247, Cl. 165-158.000.
Byrd, Alan E.; Amneus, John S.; Lucas, Malcolm B.; Van Coney, Robert H.; and Van Loan, James E., to Procter & Gamble Company, The. Method and apparatus for imparting a predetermined shape to product of dough-like consistency. 4,191,517, Cl. 425-286.000.
Cabinet Lavoix: *See*—
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Cable Belt Limited: *See*—
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Cabot Corporation: *See*—
Silence, William L., 4,191,562, Cl. 75-122.000.
Cacheux, Jean A., to Centre National d'Etudes Spatiales. Double heterojunction solar cells. 4,191,593, Cl. 136-89.0CA.
Cairns, Bruce R.; and Crockett, David B., to Fairchild Camera and Instrument Corporation. Filler-in-plastic light-scattering cover. 4,191,943, Cl. 340-378.200.
Calcimatic International Limited: *See*—
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Calco Manufacturing Company: *See*—
Fueyo, Albert, 4,191,347, Cl. 244-76.00A.
Calistrat, Michael M., to Koppers Company, Inc. Diaphragm coupling. 4,191,030, Cl. 64-13.000.
Calleance, David. Baffled watermattress construction. 4,190,917, Cl. 5-457.000.
Calorie Counter Limited Partaership: *See*—
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Calzaturificio Giuseppe Garbuio S.A.S.: *See*—
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Camenisch, Hans; and Bachner, Jarmila, to Elfotec A.G. Procedure for making a reusable photoconducting charge image carrier and charge image carriers prepared by this method. 4,191,567, Cl. 430-64.000.
Cameron Iron Works, Inc.: *See*—
Croy, David G.; Rafferty, Andrew J.; and Jolly, Richard D., 4,191,256, Cl. 166-343.000.
Cammas, Henri: *See*—
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Campbell, Billy H.; Debona, Edward J.; and Laird, William J., to United States of America, Army. Rocket detent and release mechanism. 4,191,087, Cl. 89-1.806.
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Fujiki, Makoto, 4,191,460, Cl. 354-25.000.
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Carlisle, Jeffrey A. Intravenous infusion regulation system with reciprocal metering means. 4,191,184, Cl. 128-214.00F.
Carmody, Joseph P., to Honeywell Inc. Variable symmetry multiphase clock generator. 4,191,998, Cl. 364-200.000.
Carrara, Walter G.: *See*—
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Carreiro, Ronald. Method, system and components for preserving wooden gutters. 4,190,988, Cl. 52-16.000.
Carrell, David R. Solar panel. 4,191,170, Cl. 126-449.000.
Carrier Corporation: *See*—
Samurin, Norman A.; and Straslicka, William A., 4,191,485, Cl. 403-15.000.
Carter, Donald S., to Gene Conreaux & Co., Inc. Release agents. 4,191,578, Cl. 106-1.130.
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Cascade Corporation: *See*—
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Farmer, Stanley E.; and Olson, Harlan D., 4,191,276, Cl. 187-9.00E.
Casio Computer Co., Ltd.: *See*—
Kashio, Toshio, 4,191,999, Cl. 364-405.000.
Casper, Robert S. Forearm rest for fishing rods. 4,190,977, Cl. 43-21.200.
Cassell, Don S., to Combustion Engineering, Inc. Device to reduce local heat flux through a heat exchanger tube. 4,191,246, Cl. 165-134.00R.
Cassella Aktiengesellschaft: *See*—
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Castillo, Tomas R.: *See*—
Gardiner, Arthur L.; and Castillo, Tomas R., 4,191,088, Cl. 89-33.00C.
Caterpillar Tractor Co.: *See*—
Ashmun, Raymond V.; Baker, Steven R.; and Damerell, Jerry A., 4,191,356, Cl. 248-678.000.
Dezelan, Joseph E., 4,191,017, Cl. 60-420.000.
Fuzzell, Joe E., 4,191,951, Cl. 340-610.000.
Keske, Frank E., 4,191,244, Cl. 165-69.000.
Krolak, Ronald L.; and Nelson, Delbert G., 4,191,401, Cl. 280-796.000.
Ritter, Arthur J., Jr., 4,191,073, Cl. 74-764.000.
Roley, Robert D.; and Maguire, Roy L., 4,191,431, Cl. 305-18.000.
Cavagna, Giancarlo A., to Westvaco Corporation. Dry refining process and apparatus. 4,191,335, Cl. 241-17.000.
Caveney, Jack E.; and Moody, Roy A., to Panduit Corp. Electrical connector and method of fabricating a wire harness using the connector. 4,191,442, Cl. 339-99.00R.
Celanese Corporation: *See*—
Stackman, Robert W.; and Kuczynski, Edward J., 4,191,681, Cl. 260-45.70P.
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Centre National d'Etudes Spatiales: *See*—
Cacheux, Jean A., 4,191,593, Cl. 136-89.0CA.
Cha, Chang Y., to Occidental Oil Shale, Inc. Process for recovering carbonaceous values from in situ oil shale retorting. 4,191,251, Cl. 166-260.000.

Chabert, Pierre; and Foulletier, Louis, to Produits Chimiques Ugine Kuhlmann. Stable aqueous emulsions of trichlorotrifluoroethane and method. 4,191,666, Cl. 252-545.000.

Champion International Corporation: *See*—
Austin, John J., 4,191,289, Cl. 206-45.140.
Webinger, George P., 4,191,323, Cl. 229-8.000.

Chapelet, Gilbert; Lubin, Patrice; and Nouguier, Robert, to Elf Union. Preparation of alkyl or aralkyl thiosulfates. 4,191,702, Cl. 260-453.0RY.

Charles Stark Draper Laboratory, Inc., The: *See*—
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Charlesworth, David V.: *See*—
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Charron, Francis, to Basset Bretogne Loire-B.B.L. Method of making cooled valves for internal combustion engines and valves obtained thereby. 4,190,941, Cl. 29-156.70C.

Chay, Dong M., to Du Pont de Nemours, E. I., and Company. Process for reacting liquids with solids. 4,191,736, Cl. 423-482.000.

Check, John M.; and Rupert, Gary F., to Raycon Corporation. Electrode positioning gage for multiple electrode electrical discharge machining apparatus. 4,191,878, Cl. 219-69.00E.

Check, Joseph M.; and Reed, E. Smith, Jr., to Toro Company, The. Reel mower shield assembly. 4,191,007, Cl. 56-199.000.

Chen, James Y.: *See*—
Lembo, Michael J.; and Chen, James Y., 4,191,644, Cl. 210-33.000.

Chen, Sow-Mei L.: *See*—
Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-Mei L., 4,191,699, Cl. 260-448.20D.

Cheng, Paul J., to Phillips Petroleum Company. Filtering process for a carbon black-containing gas. 4,191,542, Cl. 55-96.000.

Cherry, Richard S., to Streakers International Incorporated, The. Cabinet for use in mobile vehicle. 4,191,436, Cl. 312-293.000.

Chervenak, Michael C., to Hydrocarbon Research, Inc. Reactor residuum concentration control in hydroconversion of coal. 4,191,629, Cl. 208-10.000.

Chesley, Gilman D. Self-configurable computer and memory system. 4,191,996, Cl. 364-200.000.

Chess, David D.; Helbling, Clements A., Jr.; and Smith, Randlow, to Texaco Inc. Dual pressure fractionation of hydrocarbons. 4,191,640, Cl. 208-348.000.

Chevron Research Company: *See*—
Davis, Bruce W., 4,191,425, Cl. 299-5.000.
Lewis, Robert A.; and Honnen, Lewis R., 4,191,537, Cl. 44-71.000.
Miller, Stephen J., 4,191,634, Cl. 208-65.000.
Mitchell, David S.; and Sageman, David R., 4,191,540, Cl. 48-197.00R.

Cheysson, Philippe J.; Delons, Luc; and Le Guen, Yvon J., to Exxon Research & Engineering Co. Separator for two immiscible liquids. 4,191,651, Cl. 210-265.000.

Chia-Liu, Su. Reading rack for lying position. 4,191,354, Cl. 248-445.000.

Chicago Bridge & Iron Company: *See*—
Gardner, Lawrence R., 4,191,062, Cl. 74-242.11R.

Chicago Lock Co.: *See*—
Steinbach, Robert L., 4,191,036, Cl. 70-363.000.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T.: *See*—
Szekely, Istvan; Kovacs, Gabor; Virag, Sandor; and Szentivanyi, Matyas, 4,191,774, Cl. 424-300.000.

Chitre, NandKishore M.: *See*—
Pontano, Benjamin A.; and Chitre, NandKishore M., 4,191,926, Cl. 325-476.000.

Chiyoda Chemical Engineering & Construction Co., Ltd.: *See*—
Fukui, Yoshio; Shiroto, Yoshimi; Ando, Mamoru; and Homma, Yasumasa, 4,191,636, Cl. 208-110.000.

Chloride Group Limited: *See*—
Nicholls, Anthony T., 4,191,918, Cl. 320-23.000.

Chong, Berni P., to Rohm and Haas Company. Ion exchange process involving emulsion ion exchange resins. 4,191,812, Cl. 521-28.000.

Chopko, Michael E.; and Dreher, Hans C., to Culbro Corporation. Cigar head wrapping mechanism. 4,191,198, Cl. 131-76.000.

Christensen, Mogens A.; Hovmand, Svend; Laursen, Jens K.; and Mortensen, Henrik B., to A/S Niro Atomizer. Cleansing device for fluidized bed reactors. 4,190,963, Cl. 34-57.00A.

Christidis, Yani: *See*—
Soreau, Michel; and Christidis, Yani, 4,191,841, Cl. 562-475.000.

Chuetsu Metal Works Co., Ltd.: *See*—
Hirao, Yutaka; Hata, Kunio; and Hosoda, Masao, 4,191,564, Cl. 75-157.500.

Chung, Daniel C.; and Prevorsek, Dusan C., to Allied Chemical Corporation. Abrasion resistant polyester carbonates. 4,191,790, Cl. 427-164.000.

Ciba-Geigy Aktiengesellschaft: *See*—
Riethmann, Jean; Marti, Franz; and Somlo, Tibor, 4,191,621, Cl. 204-158.0HA.

Ciba-Geigy Corporation: *See*—
Brunetti, Heimo; Rody, Jean; Soma, Nobuo; and Kurumada, Tomoyuki, 4,191,683, Cl. 260-45.80N.
Burri, Peter, 4,191,690, Cl. 260-343.30R.
Habermeier, Jurgen; and Moser, Roland, 4,191,835, Cl. 560-49.000.
Habermeier, Jurgen; and Moser, Roland, 4,191,836, Cl. 560-49.000.
Jeanneret, Remy; Zwahlen, Gunther; Frey, Christoph; and Zographos, Georgios, 4,191,566, Cl. 430-31.000.
Ramey, Chester E.; and Luzzi, John J., 4,191,682, Cl. 260-45.80N.
Ramey, Chester E.; and Luzzi, John J., 4,191,829, Cl. 546-222.000.

Cina, Ronald A.; and Kluge, Albert D., to Roberts Corporation. Blow plate structure and mold formed thereby. 4,191,239, Cl. 164-200.000.

Circuit Assembly Corp.: *See*—
Thomas, Philip J.; and McAllister, John A., 4,190,952, Cl. 29-629.000.

Citizen Watch Company Limited: *See*—
Yasuda, Yuh; Kizaki, Sigeru; and Miya, Yukio, 4,191,905, Cl. 310-344.000.

Cla-Mar International Corp.: *See*—
Mansfield, Martin J., Jr., 4,191,275, Cl. 182-3.000.

Clapp, Ronald E.; and Cunningham, David L. Training device for horsemanship. 4,190,968, Cl. 35-29.00R.

Clark, Richard E.; Skelton, John; and Davis, Robert B., to Albany International Corp.; and Washington University. Fabrics for heart valve and vascular prostheses and methods of fabricating same. 4,191,218, Cl. 139-383.00R.

Cobbs, James H. Method of installing a liner in a large diameter borehole. 4,191,492, Cl. 405-133.000.

Cobe Laboratories, Inc.: *See*—
Goyne, Thomas E., 4,191,351, Cl. 248-311.10R.

Cochran, Wilson V.: *See*—
Bivens, Jon A.; and Cochran, Wilson V., 4,191,331, Cl. 239-231.000.

Codrington, Robert S.: *See*—
Haney, Richard M.; Stillman, Robert A.; and Codrington, Robert S., 4,191,919, Cl. 324-312.000.

Cohen, Abraham B.; and Ni Fan, Roxy, to Du Pont de Nemours, E. I., and Company. Process for image reproduction using multilayer photosensitive element with solvent-soluble layer. 4,191,572, Cl. 430-260.000.

Cohen, Arik, to Rim Jerusalem Furniture Limited. Drawer construction. 4,191,439, Cl. 312-330.00R.

Cohen, Noal; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Protected alcohols. 4,191,842, Cl. 568-662.000.

Coker, Thomas G.; Dempsey, Russell M.; and LaConti, Anthony B., to General Electric Company. Production of halogens in an electrolysis cell with catalytic electrodes bonded to an ion transporting membrane and an oxygen depolarized cathode. 4,191,618, Cl. 204-98.000.

Cole, John W.: *See*—
Shuck, William D.; Lind, Frederick D.; and Cole, John W., 4,191,479, Cl. 366-101.000.

Coles, George A. Telephone-coupled visual alphanumeric communication device for deaf persons. 4,191,854, Cl. 179-2.00R.

Colgan, John J., Jr., to RCA Corporation. Image pickup assembly. 4,191,936, Cl. 335-210.000.

Colkhi, Inc.: *See*—
Jacobi, Edgar F.; and Madden, Mark R., 4,191,207, Cl. 137-344.000.

Colles, Joseph H.: *See*—
Hong, Byung S.; Colles, Joseph H.; Scofield, David D.; Purdy, Stephen J.; and Reinsch, Stephen J., 4,191,456, Cl. 353-31.000.

Colley, Donna J.; and Easterwood, Michael L. Endotracheal support and stabilization device. 4,191,180, Cl. 128-207.170.

Collins, Earl R.: *See*—
United States of America, National Aeronautics and Space Administration; and Collins, Earl R., 4,191,159, Cl. 125-21.000.

Collins, Royal D.: *See*—
Halas, Linda A.; Gilbert, Lawrence A.; Staab, Robert A.; Collins, Royal D.; and Ries, Charles R., 4,191,661, Cl. 252-103.000.

Columberg, Alfred, to Battelle Memorial Institute. Process for the preparation of olefine polymerization catalysts. 4,191,816, Cl. 526-124.000.

Combi-Lock Enterprises Limited: *See*—
Hatch, George, 4,191,035, Cl. 70-298.000.

Combustion Engineering, Inc.: *See*—
Cassell, Don S., 4,191,246, Cl. 165-134.00R.

Commissariat a l'Energie Atomique: *See*—
Robert, Jacques, 4,191,955, Cl. 340-753.000.
Sourrouille, Michel, 4,191,475, Cl. 356-318.000.

Commonwealth Scientific and Industrial Research Organization: *See*—
Guise, Geoffrey B.; and White, Maxwell A., 4,191,802, Cl. 428-375.000.

Communications Satellite Corporation: *See*—
Meadows, George A., 4,191,888, Cl. 250-396.00R.
Pontano, Benjamin A.; and Chitre, NandKishore M., 4,191,926, Cl. 325-476.000.

Compton, Marshall F. Concrete strike-off vibrator. 4,191,093, Cl. 91-234.000.

Congoleum Corporation: *See*—
Hamilton, Artimus C., 4,191,581, Cl. 106-20.000.

Conly, William A.: *See*—
Hansen, William A.; and Conly, William A., 4,191,592, Cl. 134-48.000.

Connolly, Joseph J.: *See*—
Redfern, Thomas P.; Connolly, Joseph J.; and Frederiksen, Thomas M., 4,191,900, Cl. 307-355.000.

Connolly, Walter L., to Daniel Industries, Inc. Fabricated orifice fitting mechanism for pipelines. 4,191,216, Cl. 138-44.000.

Connor, David T.; Ringel, Samuel M.; Roemer, Sidney; and von Strandtmann, Maximillian, to Warner-Lambert Company. Diacyloxyacids derived from acid S, an antibiotic produced by *Polyangium cellulosum* var. *fulvum*. 4,191,825, Cl. 542-430.000.

Conoco, Inc.: *See*—
Albright, James C.; and Gant, Preston L., 4,191,883, Cl. 250-259.000.
Irvine, John L., 4,191,737, Cl. 423-630.000.

Conrad, Robert A.; Cullinan, George J.; Miller, Jean C.; and Gerzon, Koert, to Eli Lilly and Company. Amides of leurosine, leuroformine, desacetylleurosine and desacetylleuroformine. 4,191,688, Cl. 260-244.400.

Consiglio Nazionale della Ricerche: *See*—
Rinelli, Giorgio; and Abbruzzese, Carlo, 4,191,729, Cl. 423-98.000.

Container Corporation of America: *See*—
Jenkins, Charles W., 4,191,541, Cl. 55-18.000.

Continental Group, Inc., The: *See*—
Davis, Glenn L., 4,191,305, Cl. 220-462.000.
Hasegawa, Gary K.; and Mascia, Carmen T., 4,190,957, Cl. 30-411.000.
Mascia, Carmen T., 4,190,956, Cl. 30-410.000.

Continental Oil Company: *See*—
Gorin, Everett, 4,191,538, Cl. 48-197.00R.

Control Concepts, Inc.: *See*—
Zeuner, Kenneth W.; and Jarman, Alonzo B., 4,191,091, Cl. 91-52.000.

Conybear, James G.; and Titus, Wallace J., to Midland-Ross Corporation. Jet recirculation method for vacuum carburizing. 4,191,598, Cl. 148-16.500.

Cook, Elton S.; and Fujii, Akira, to Stanley Drug Products, Inc. Method of treating bacterial infections. 4,191,779, Cl. 424-319.000.

Cooper, Paul V.; and Adamson, Steven J., to Plessey Handel und Investments AG. Magnetic domain packaging. 4,192,011, Cl. 365-2.000.

Copal Company Limited: *See*—
Okabe, Katsuhiko, 4,191,104, Cl. 101-93.140.

Cope, Andrew P., to Du Pont de Nemours, E. I., and Company. Label applicator. 4,191,607, Cl. 156-384.000.

Cope, Cecil J., to Cope Whelon and Company, Limited. Egg-deshelling apparatus. 4,191,102, Cl. 99-580.000.

Cope Whelon and Company, Limited: *See*—
Cope, Cecil J., 4,191,102, Cl. 99-580.000.

Copperwheat, Cyril, to Uni-Drive (Tractors) Limited. Mechanical link members. 4,191,280, Cl. 188-300.000.

Coren, Gerald. Clip-on protector. 4,191,987, Cl. 361-124.000.

Corning Glass Works: *See*—
Armistead, William H.; and Lachman, Irwin M., 4,191,583, Cl. 106-39.600.
Wu, Che-Kuang, 4,191,547, Cl. 65-30.00R.

Cosden Technology, Inc.,: *See*—
Watson, James M.; and Johnson, Michael E., 4,191,614, Cl. 202-177.000.

Cosyns, Jean; Marcilly, Christian; Miquel, Jean; and Le Page, Jean-Francois, to Institut Francais du Petrole. Process for the production of benzene from hydrocarbon fractions rich in alkyl-aromatic hydrocarbons and containing paraffinic and naphthenic hydrocarbons. 4,191,632, Cl. 585-483.000.

Courten, Henry C.; and Mattal, Joseph P., to Grumman Aerospace Corporation. Aircraft armament alignment. 4,191,471, Cl. 356-154.000.

Cowell, David, to Sybron Corporation. Preheat circuit for X-ray tubes. 4,191,889, Cl. 250-402.000.

Coyle, Forrest E., to Westinghouse Electric Corp. Push-button assembly. 4,191,871, Cl. 200-159.00R.

Craycraft, Donald G., to NCR Corporation. ROM memory cell with 2^n FET channel widths. 4,192,014, Cl. 365-104.000.

Crockett, David B.: *See*—
Cairns, Bruce R.; and Crockett, David B., 4,191,943, Cl. 340-378.200.

Cronin, John. Door guard. 4,190,926, Cl. 16-65.000.

Crossley, Roger, to John Wyeth & Brother Ltd. Copper complexes of tetrahydroquinoline derivatives having anti-ulcer activity. 4,191,761, Cl. 424-245.000.

Croy, David G.; Rafferty, Andrew J.; and Jolly, Richard D., to Cameron Iron Works, Inc. Subsea flowline connector. 4,191,256, Cl. 166-343.000.

Cruickshank, Ann M. Terry hair drier. 4,190,907, Cl. 2-202.000.

Culbro Corporation: *See*—
Chopko, Michael E.; and Dreher, Hans C., 4,191,198, Cl. 131-76.000.

Cullinan, George J.: *See*—
Conrad, Robert A.; Cullinan, George J.; Miller, Jean C.; and Gerzon, Koert, 4,191,688, Cl. 260-244.400.

Cummins Engine Company, Inc.: *See*—
Patel, Harshad H.; and Bose, Tejandra N., 4,191,148, Cl. 123-119.0CD.

Cunningham, David L.: *See*—
Clapp, Ronald E.; and Cunningham, David L., 4,190,968, Cl. 35-29.00R.

Cunningham, Francis V., to Joslyn Mfg. and Supply Co. Current limiting spark gap for achieving arc elongation, division and compression without the use of supplementary magnetic means. 4,191,908, Cl. 313-325.000.

Cunningham, Ronald J. Fan speed control used in induction cooking apparatus. 4,191,875, Cl. 219-10.49R.

Cupery, Willis E., to Du Pont de Nemours, E. I., and Company. Growth retardants. 4,191,551, Cl. 71-86.000.

Curran, Roger J., to Bangor Punta Operations, Inc. Gas fired gun and plastic valve therefor. 4,191,158, Cl. 124-76.000.

Curtis Instruments, Inc.: *See*—
Finger, Eugene P., 4,192,009, Cl. 364-829.000.

Dahlen, John M.: *See*—
Bowditch, Philip N.; Dahlen, John M.; McKenna, John F., Jr.; Shillingford, John T., Jr.; Siraco, Frank J.; and Toth, William E., 4,191,049, Cl. 73-170.00A.

Daichiku Co., Ltd.: *See*—
Kunimasa, Oide, 4,190,986, Cl. 51-295.000.

Daimler-Benz Aktiengesellschaft: *See*—
Krohn, Hellmut; Kruse, Werner; and Resch, Reinhard, 4,191,020, Cl. 60-550.000.

Dain, Richard J., to Powdrex Limited. Atomizer for making powder. 4,191,516, Cl. 425-7.000.

Dambrine, Francis, to Fives-Cail Babcock. Method and apparatus for reducing the calorific consumption of a cement producing plant. 4,191,586, Cl. 106-100.000.

Damerell, Jerry A.: *See*—
Ashmun, Raymond V.; Baker, Steven R.; and Damerell, Jerry A., 4,191,356, Cl. 248-678.000.

Dameron, James. Sanitary device. 4,191,414, Cl. 294-1.0BA.

Damper Design, Inc.: *See*—
Hagar, Donald K., 4,191,212, Cl. 137-601.000.

Dana Corporation: *See*—
Brown, Robert J., 4,191,279, Cl. 188-82.840.

Daniel Industries, Inc.: *See*—
Connolly, Walter L., 4,191,216, Cl. 138-44.000.

Dansac, Jean; Pepin, Christian; and Cammas, Henri, to Thomson-CSF. Infrared imaging device using a pyroelectric image tube. 4,191,967, Cl. 358-113.000.

Dart Industries Inc.: *See*—
Rabin, Yehuda, 4,191,366, Cl. 269-47.000.

Darvin, Herbert S. Foot measuring device. 4,190,959, Cl. 33-3.00B.

Das, Mukunda B.: *See*—
Schmidt, Pierre E.; and Das, Mukunda B., 4,191,963, Cl. 357-23.000.

Data General Corporation: *See*—
Braun, William A., 4,191,976, Cl. 360-51.000.

Dataproducts Corporation: *See*—
McMillan, Norman; and Dier, Henry M., 4,191,724, Cl. 264-255.000.

Dauber, Louis, to Exxon Research & Engineering Co. Process for suppression of hydrogenolysis and C_5^{30} liquid yield loss in a reforming unit. 4,191,633, Cl. 208-65.000.

DaVia, Louis. Board game. 4,191,379, Cl. 273-258.000.

Davis, Bruce W., to Chevron Research Company. Ethanolamine in a method of recovering coal in aqueous slurry form. 4,191,425, Cl. 299-5.000.

Davis, Glenn L., to Continental Group, Inc., The. Container having blown plastic liner and method and apparatus for forming same. 4,191,305, Cl. 220-462.000.

Davis Industrial (Filters) Limited: *See*—
Davis, Maurice, 4,191,235, Cl. 151-55.000.

Davis, Kirk E., to Lubrizol Corporation, The. Sulfurized compositions. 4,191,659, Cl. 252-45.000.

Davis, Maurice, to Davis Industrial (Filters) Limited. Holding devices. 4,191,235, Cl. 151-55.000.

Davis, Robert B.: *See*—
Clark, Richard E.; Skelton, John; and Davis, Robert B., 4,191,218, Cl. 139-383.00R.

Dawkins, Kenneth R.: *See*—
Mattson, Frank J.; Lawler, John T.; Stegall, Jack L.; and Dawkins, Kenneth R., 4,191,209, Cl. 137-486.000.

Day, Robert H. Releasable coupling for display unit extension bar. 4,191,438, Cl. 312-306.000.

Dayco Corporation: *See*—
Bollmer, Jacob A.; Stearns, Joseph E.; and Brooks, Alvin R., Jr., 4,191,076, Cl. 83-13.000.

Deal, Robert S., to Multilam Corporation. Louvered electrical connector. 4,191,445, Cl. 339-252.00R.

Dean, Noel S.; Lawton, Kenneth L.; and Yates, Vincent A., to BICC Limited. Optical guides. 4,191,448, Cl. 350-96.230.

DeBerg, Gary J. Windmill. 4,191,507, Cl. 416-117.000.

De Blois, Ralph W.: *See*—
Uzgiris, Egidijus E.; and De Blois, Ralph W., 4,191,739, Cl. 424-12.000.

Debona, Edward J.: *See*—
Campbell, Billy H.; Debona, Edward J.; and Laird, William J., 4,191,087, Cl. 89-1.806.

Dedeian, Charles: *See*—
Dedeian, John R.; and Dedeian, Charles, 4,191,173, Cl. 126-350.00R.

Dedeian, John R.; and Dedeian, Charles. Self-heating cup. 4,191,173, Cl. 126-350.00R.

Deere & Company: *See*—
Miller, Wayne R.; Latham, David D.; and Spencer, Joseph C., 4,191,061, Cl. 74-108.000.

De Langis, David J.; and De Langis, Philip A. Shower head flow control device. 4,191,332, Cl. 239-428.500.

De Langis, Philip A.: *See*—
De Langis, David J.; and De Langis, Philip A., 4,191,332, Cl. 239-428.500.

Del Bianco, Cosmo. Brake adjusting spoon. 4,190,931, Cl. 81-3.00R.

Della Torre, Giancarlo, to Rockwell-Rimoldi, S.p.A. Method and apparatus for attaching an elastic band to a tubular workpiece. 4,191,117, Cl. 112-2.000.

Dellorfano, Fred M., Jr.: *See*—
Massa, Frank, 4,191,904, Cl. 310-322.000.

Delons, Luc: *See*—
Cheysson, Philippe J.; Delons, Luc; and Le Guen, Yvon J., 4,191,651, Cl. 210-265.000.

Delta Materials Research Limited: *See*—
Hart, William B.; and Williams, Reginald T., 4,191,053, Cl. 73-363.100.

Demny, Werner: *See*—
Brauer, Hans; and Demny, Werner, 4,191,041, Cl. 72-235.000.

Dempsey, Russell M.: *See*—
Coker, Thomas G.; Dempsey, Russell M.; and LaConti, Anthony B., 4,191,618, Cl. 204-98.000.

Denwalt, William C., Jr.: *See*—
Hickman, Charles E.; and Denwalt, William C., Jr., 4,191,301, Cl. 212-69.000.

Desmars, Gabriel: *See*—
Beghi, Rene; Desmars, Gabriel; Monie, Yvan; and Pessayre, Raymond, 4,191,300, Cl. 212-41.000.

DeSoto, Inc.: *See*—
Josefson, Arnold J.; and Munson, Loren R., 4,191,624, Cl. 204-181.00T.

De Souza, Jose D., to Electrometal Acos Finos S. A., BRX. Process for fabrication of a consumable metallic electrode. 4,190,946, Cl. 29-527.700.

Dessauer, Guido; Riecke, Kurt; and Land, Ferdinand, to Feldmühle Aktiengesellschaft. Donor material for carbonless copying. 4,191,403, Cl. 282-27.500.

Deubner, Ted E.: *See*—
Golobay, Gary L.; Deubner, Ted E.; and Beugelsdyk, Anthony F., 4,191,065, Cl. 74-489.000.

Deutsch, Leslie J.: *See*—
Deutsch, Ralph; and Deutsch, Leslie J., 4,191,081, Cl. 84-1.030.

Deutsch, Ralph; and Deutsch, Leslie J., to Kawai Musical Instrument Mfg. Co., Ltd. Selectable automatic arpeggio for electronic musical instrument. 4,191,081, Cl. 84-1.030.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
Kingler, Karl H.; Thiemer, Klause; and Stroman, Fritz, 4,191,777, Cl. 424-316.000.

Deutschmann, Herbert, to Motoren- und Turbinen-Union Friedrichshafen GmbH. Multi-cylinder internal combustion engine. 4,191,152, Cl. 123-119.00C.

Dewey, Herbert F. Ferrule rolling machine. 4,191,040, Cl. 72-132.000.

Dezelan, Joseph E., to Caterpillar Tractor Co. Motor displacement control system. 4,191,017, Cl. 60-420.000.

Dhein, Rolf: *See*—
Meyer, Rolf-Volker; Dhein, Rolf; Schneider, Kurt; and Fahnler, Friedrich, 4,191,819, Cl. 528-315.000.

Diaferia, Henry V.: *See*—
DiMatteo, Paul L.; and Diaferia, Henry V., 4,190,913, Cl. 5-81.00R.

Diallo, Souleymane. Sleep unit. 4,190,914, Cl. 5-247.000.

Diamond Insulation Industries, Inc.: *See*—
Bontrager, Kenneth L.; Bontrager, Marion R.; Taylor, Robert J.; and Card, David C., 4,191,224, Cl. 141-100.000.

Diamond, Steven E.: *See*—
Tovrog, Benjamin S.; Diamond, Steven E.; and Mares, Frank, 4,191,696, Cl. 260-348.330.

Didier-Werke A.G.: *See*—
Boggum, Paul; and Schulte, Klaus, 4,191,528, Cl. 432-248.000.

Dier, Henry M.: *See*—
McMillan, Norman; and Dier, Henry M., 4,191,724, Cl. 264-255.000.

Diermayer, Werner; and Kutzner, Luitpold. Draft control arrangement for combustion apparatus. 4,191,326, Cl. 236-1.00G.

DiFrancesco, Alphonse B.: *See*—
Boase, Elmer E.; DiFrancesco, Alphonse B.; and Ring, Stuart F., 4,191,465, Cl. 355-3.0SH.

Digital Communications, Inc.: *See*—
Kirk, Donald, Jr., 4,191,968, Cl. 358-141.000.

DiMatteo, Paul L.; and Diaferia, Henry V., to Solid Photography Inc. Invalid bed arrangement. 4,190,913, Cl. 5-81.00R.

Dingeldein, Elvira: *See*—
Heusser, Dietrich; and Dingeldein, Elvira, 4,191,740, Cl. 424-14.000.

Dischert, Robert A.; and Thorpe, Laurence J., to RCA Corporation. System for connecting a plurality of video sending television apparatus. 4,191,971, Cl. 358-210.000.

Disston, Inc.: *See*—
Brown, Wayne R.; Jones, John E.; and Sherrill, Charles F., 4,191,917, Cl. 320-2.000.

Dixon, Robert P.; and Shannon, Francis T., to General Electric Company. Power line protection circuit. 4,191,925, Cl. 325-474.000.

Dixon, William R., to Hoffmann-La Roche Inc. Immunoassay for N-desmethyldiazepam. 4,191,738, Cl. 424-1.000.

Dolling, Ludvik; Haag, Wilhelm; and Heindze, Herbert, to AGFA-Gevaert, A.G. Change over device for continuously casting various emulsions for photographic purposes. 4,191,213, Cl. 137-625.170.

Dollman, David Y.; and O'Grady, Timothy J., to Union Carbide Corporation. Method and compositions for coating aluminum. 4,191,596, Cl. 148-6.270.

Donegan, Charles E.: *See*—
Quinn, John E.; Wittenbrook, Lawrence S.; and Donegan, Charles E., 4,191,655, Cl. 252-60.000.

Donzis, Byron A. Channel beam having heat transfer fluid volume defined therein. 4,191,243, Cl. 165-45.000.

Dorlini, Peter J. Shopping cart with auxiliary sled attachment. 4,191,391, Cl. 280-9.000.

Dorn, Silvia, to Hoffmann-La Roche Inc. Synergistic insecticidal composition. 4,191,773, Cl. 424-282.000.

Dougherty, Lawrence W., to Zenith Radio Corporation. Color CRT with shadow mask having peripherally grooved skirt. 4,191,909, Cl. 313-402.000.

Doveri, Carlo, to Piaggio & C. S.p.A. Two-stroke, water-cooled internal combustion engine having the cylinder liners removable from the cylinder block. 4,191,156, Cl. 123-193.00C.

Doyle, Earl N.: *See*—
Baughman, Kenneth E.; and Doyle, Earl N., 4,191,254, Cl. 166-286.000.

Doyle, Richard C., to Slater Electric Inc. Electrical connector means. 4,191,443, Cl. 339-103.00R.

Drabb, Thomas W., Jr.; and Lovell, James B., to American Cyanamid Company. Pentadienone hydrazones, method for preparing the same, and insecticidal use thereof. 4,191,768, Cl. 424-251.000.

Draper, George L., to Nav-All, Incorporated. Apparatus and methods for position determining and plotting. 4,192,002, Cl. 364-449.000.

Drechsel, Erhart K.; and Sardisco, John B., to Pennzoil Company. Fluoride-free phosphate reactions. 4,191,734, Cl. 423-320.000.

Dreher, Hans C.: *See*—
Chopko, Michael E.; and Dreher, Hans C., 4,191,198, Cl. 131-76.000.

Drehman, Lewis E.: *See*—
Farha, Floyd, Jr.; and Drehman, Lewis E., 4,191,846, Cl. 585-440.000.

Dresser Europe S.A.: *See*—
Ely, Peter, 4,191,426, Cl. 299-39.000.

Drzewiecki, Tadeusz M., to United States of America, Army. Non-contact flueric temperature sensing method and apparatus. 4,191,052, Cl. 73-357.000.

Dunne, William A. Water chillers and air cooled refrigeration units. 4,191,029, Cl. 62-428.000.

Du Pont de Nemours, E. I., and Company: *See*—
Chay, Dong M., 4,191,736, Cl. 423-482.000.
Cohen, Abraham B.; and Ni Fan, Roxy, 4,191,572, Cl. 430-260.000.
Cope, Andrew P., 4,191,607, Cl. 156-384.000.
Cupery, Willis E., 4,191,551, Cl. 71-86.000.
Edwards, Donald W.; Gorondy, Emery J.; and van Roggen, Arend, 4,191,961, Cl. 346-74.100.
Gregory, Walter A., 4,191,554, Cl. 71-95.000.
Reap, James J., 4,191,553, Cl. 71-92.000.
Schumacher, Frederick G.; and Yllo, Walter, 4,191,798, Cl. 428-95.000.

Du Prez, Eddie: *See*—
Jourquin, Lucien; and Du Prez, Eddie, 4,191,815, Cl. 521-51.000.

Duramettallic Corporation: *See*—
Hershey, Lowell E., 4,191,386, Cl. 277-22.000.

Duran, John A., to Avibank Mfg., Inc. Captive panel fastener assembly. 4,191,236, Cl. 151-69.000.

Durant, Graham J.; Ganellin, Charon R.; and Young, Rodney C., to Smith Kline & French Laboratories Limited. Isothiourea compounds and pharmacological use. 4,191,769, Cl. 424-263.000.

Duren, Gottfried: *See*—
Bender, Hans; Schnabel, Georg; Duren, Gottfried; and Zabel, Wolf, 4,191,591, Cl. 134-25.00R.

Durling, Harold, to Midland-Ross Corporation. Air brake system with pressure holding valve. 4,191,428, Cl. 303-6.00M.

Durr, Helmut E.; and Mock, George E., to Western Electric Company, Incorporated. Apparatus for supporting a reel of cable for rotation. 4,191,339, Cl. 242-54.00R.

Durst A.G. Fabrik Fototechnischer Apparate: *See*—
Gandini, Mario, 4,191,466, Cl. 355-35.000.

Dutta, Rathindra; Rosgen, Josef; and Rosemann, Gerd, to Societe Industrielle de Brevets et d'Etudes S.I.B.E. Carburetors for internal combustion engines. 4,191,149, Cl. 123-119.0EC.

Dyno Industrier A.S: *See*—
Hiorth, Hans, 4,191,480, Cl. 366-336.000.

E. R. Squibb & Sons, Inc.: *See*—
Hoehn, Hans, 4,191,831, Cl. 546-278.000.

Easterwood, Michael L.: *See*—
Colley, Donna J.; and Easterwood, Michael L., 4,191,180, Cl. 128-207.170.

Eastman Kodak Company: *See*—
Barnsbee, Clive D., 4,191,201, Cl. 134-104.000.
Boase, Elmer E.; DiFrancesco, Alphonse B.; and Ring, Stuart F., 4,191,465, Cl. 355-3.0SH.

Eaton Corporation: *See*—
Keranen, John J., 4,191,066, Cl. 74-527.000.
Woodard, Tony O., 4,191,873, Cl. 200-302.000.

Eaton, Edward M. Quick acting coupling. 4,191,406, Cl. 285-35.000.

Eberle, John H.: *See*—
Strem, Robert C.; Strem, R. C.; and Eberle, John H., 4,191,153, Cl. 123-133.000.

Ebersberger, Hans: *See*—
Amtmann, Heribert; Ebersberger, Hans; Eckardt, Guenter; and Greiner, Hans-Joachim, 4,191,891, Cl. 250-402.000.

Eckardt, Guenter: *See*—
Amtmann, Heribert; Ebersberger, Hans; Eckardt, Guenter; and Greiner, Hans-Joachim, 4,191,891, Cl. 250-402.000.

Eckhoff, Paul S. Method of preventing peel of old paint. 4,191,796, Cl. 427-408.000.

Economopoulos, Marios: *See*—
Paulus, Philippe A.; and Economopoulos, Marios, 4,191,600, Cl. 148-142.000.

Edens, Walter W.; and Ingerson, Quentin F., to Ampco-Pittsburgh Corporation. Copper-nickel-silicon-chromium alloy having improved electrical conductivity. 4,191,601, Cl. 148-160.000.
Edwards, Donald W.; Gorondy, Emery J.; and van Roggen, Arend, to Du Pont de Nemours, E. I., and Company. Magnetic printing process and apparatus. 4,191,961, Cl. 346-74.100.
Edwards, Richard L.; and Kesten, Martin, to Preston Engravers, Inc. Bearing block with air supply passage. 4,191,077, Cl. 83-99.000.
Egan, John J.: *See*—
Lyons, William E.; and Egan, John J., 4,191,338, Cl. 241-245.000.
Eguchi, Yasukata; and Makabe, Hachiro, to Janome Sewing Machine Co. Ltd. Buttonhole stitch control system for a sewing machine. 4,191,121, Cl. 112-158.00B.
Ehrlinger, Friedrich J.; and Bock, Horst, to Zahnradfabrik Friedrichshafen AG. Transmission with hydrodynamic torque converter and retarder. 4,191,072, Cl. 74-732.000.
Electric Power Research Institute, Inc.: *See*—
Lebowitz, Howard E.; Wolk, Ronald H.; Alpert, Seymour B.; Stewart, Norman C.; and Rovesti, William C., 4,191,700, Cl. 260-449.00M.
Sisk, Francis J.; and Veyo, Stephen E., 4,191,023, Cl. 62-79.000.
Sisk, Francis J., 4,191,026, Cl. 62-140.000.
Electrometal Acos Finos S. A.: *See*—
De Souza, Jose D., 4,190,946, Cl. 29-527.700.
Elf Union: *See*—
Chapelet, Gilbert; Lubin, Patrice; and Nouguier, Robert, 4,191,702, Cl. 260-453.0RY.
Elfotec A.G.: *See*—
Camenisch, Hans; and Bachner, Jarmila, 4,191,567, Cl. 430-64.000.
Eli Lilly and Company: *See*—
Conrad, Robert A.; Cullinan, George J.; Miller, Jean C.; and Gerzon, Koert, 4,191,688, Cl. 260-244.400.
Gorman, Marvin; Higgens, Calvin E.; and Nagarajan, Ramakrishnan, 4,191,763, Cl. 424-246.000.
Hudson, James L.; and Wagner, Jack F., 4,191,741, Cl. 424-19.000.
Su, Kenneth S.; Templeton, Robert J.; and Wikel, James H., 4,191,832, Cl. 548-306.000.
Zimmerman, Dennis M., 4,191,771, Cl. 424-267.000.
Elias, Pauline. Bathtub mop. 4,190,922, Cl. 15-244.00A.
Elliott, William G., to Roger's Plating Limited. Collapsible barbecue. 4,191,160, Cl. 126-9.00R.
Elliott, William T.: *See*—
Salome, Frederik; and Elliott, William T., 4,191,672, Cl. 260-29.6PM.
Ellson, Robert: *See*—
Jacoby, Marvin; Jacoby, Richard; and Ellson, Robert, 4,191,054, Cl. 73-421.50R.
Ely, Peter, to Dresser Europe S.A. Improved sealing guard for a surface treating machine. 4,191,426, Cl. 299-39.000.
Ely, Richard H.; and Haynes, Larry E. Pumping arrangements to conserve energy. 4,191,514, Cl. 417-529.000.
Ema, Hideaki; Otomura, Satoshi; Imai, Chikara; and Sakai, Kiyoshi, to Ricoh Co., Ltd. Photosensitive material for electrophotography with dye containing overlayer. 4,191,568, Cl. 430-66.000.
Emery Industries, Inc.: *See*—
Hinze, Adrien G.; and Stigter, Hendrik G., 4,191,669, Cl. 260-18.00N.
Emmert, Raymond L. Bench folding leg and brace structure. 4,191,111, Cl. 108-132.000.
Emmett, John L., to United States of America, Energy. Laser system using regenerative amplifier. 4,191,928, Cl. 330-4.300.
Endo, Takaya; Sato, Shui; Kikuchi, Shoji; Kozima, Tamotsu; Usui, Tugumoto; Imamura, Hiroyuki; and Takabe, Koichi, to Konishiroku Photo Industry Co., Ltd. Process for forming a photographic magenta dye image. 4,191,574, Cl. 430-387.000.
Engelhart, John E.: *See*—
Gitlitz, Melvin H.; and Engelhart, John E., 4,191,698, Cl. 260-429.700.
Entek Corporation: *See*—
Turner, James E., 4,191,522, Cl. 425-552.000.
Environmental Research Institute of Michigan: *See*—
Polcyn, Fabian C.; Marshall, Robert E.; and Nichols, H. Janney, 4,191,940, Cl. 340-146.30B.
Walker, Jack L.; and Carrara, Walter G., 4,191,957, Cl. 343-5.0PC.
Envirotech Corporation: *See*—
Whitmore, Edward A., 4,191,652, Cl. 210-274.000.
Equipment Company of America: *See*—
Maldonado, Felipe, 4,191,112, Cl. 108-53.300.
Ercolani, Dario: *See*—
Arrigoni, Virgilio; Ercolani, Dario; and Ferrini, Francesco, 4,191,047, Cl. 73-61.400.
Erickson, Chad S., to Alternative Pioneering Systems, Inc. Food dehydrator. 4,190,965, Cl. 34-196.000.
Ernst Leitz Wetzlar GmbH: *See*—
Schick, Dieter, 4,191,477, Cl. 356-373.000.
ESB Incorporated: *See*—
Levy, Isaac I., 4,191,806, Cl. 429-56.000.
ESGE-Marby GmbH & Co.: *See*—
Niemann, Heinz, 4,191,393, Cl. 280-289.00A.
Essex Group, Inc.: *See*—
King, John A.; and O'Brien, Douglas W., 4,191,865, Cl. 179-178.000.
Etablissement d'Occident: *See*—
Panigati, Pier L., 4,191,203, Cl. 137-112.000.
Etablissements Francois Salomon et Fils: *See*—
Salomon, Georges P. J., 4,191,395, Cl. 280-613.000.
Etat Francais Represente par le Ministere de l'Environment et du Cadre de Vie Laboratorie Central des Ponts et Chaussees: *See*—
Ray, Michel; and Nissoux, Jean L., 4,191,489, Cl. 404-51.000.
Ethyl Corporation: *See*—
Niebylski, Leonard M., 4,191,536, Cl. 44-63.000.
Ettridge, John P. Sealing system for a rotary machine. 4,191,515, Cl. 418-61.00R.
Euteco S.p.A.: *See*—
Vargiu, Silvio; Manzoni, Pier L.; and Bernasconi, Mario, 4,191,723, Cl. 264-129.000.
Eutectic Corporation: *See*—
Lyons, John E., 4,191,791, Cl. 427-224.000.
Patel, Mahesh S., 4,191,565, Cl. 75-252.000.
Evans, Stephen M. Method for securing composition board panels together. 4,191,606, Cl. 156-288.000.
Ewald, Otto: *See*—
Biermann, Peter; and Ewald, Otto, 4,191,396, Cl. 280-615.000.
Exxon Research & Engineering Co.: *See*—
Cheysson, Philippe J.; Delons, Luc; and Le Guen, Yvon J., 4,191,651, Cl. 210-265.000.
Dauber, Louis, 4,191,633, Cl. 208-65.000.
Fahnler, Friedrich: *See*—
Meyer, Rolf-Volker; Dhein, Rolf; Schneider, Kurt; and Fahnler, Friedrich, 4,191,819, Cl. 528-315.000.
Fairchild Camera and Instrument Corporation: *See*—
Cairns, Bruce R.; and Crockett, David B., 4,191,943, Cl. 340-378.200.
Kant, Rajni, 4,191,964, Cl. 357-51.000.
Farha, Floyd, Jr.; and Drehman, Lewis E., to Phillips Petroleum Company. Catalytic dehydrogenation process. 4,191,846, Cl. 585-440.000.
Faris, Charles G.; and Manley, Edward H., to Swiss Aluminium Ltd. Interrupted circuit test with memory and display device. 4,191,954, Cl. 340-679.000.
Farlow, Don M. Cattle chute with directional restricting means. 4,191,131, Cl. 119-155.000.
Farmer, Stanley E., to Cascade Corporation. Telescopic ram. 4,191,092, Cl. 91-189.00R.
Farmer, Stanley E.; and Olson, Harlan D., to Cascade Corporation. High-visibility two-stage mast assembly for lift trucks. 4,191,276, Cl. 187-9.00E.
Farmitalia Carlo Erba S.p.A.: *See*—
Masi, Paolo; Suarato, Antonino; Bernardi, Luigi; and Arcamone, Federico, 4,191,755, Cl. 424-180.000.
Masi, Paolo; Suarato, Antonino; Bernardi, Luigi; and Arcamone, Federico, 4,191,756, Cl. 424-180.000.
Farrow, Cecil W., to Bell Telephone Laboratories, Incorporated. Digital automatic gain control circuit. 4,191,995, Cl. 364-113.000.
Fassett, Kendall G.; and Norris, Jeffery G. Portable chair and storage unit. 4,191,420, Cl. 297-194.000.
Fastway Fasteners, Inc.: *See*—
Schuplin, Jerome T., 4,191,352, Cl. 248-317.000.
Faudarole, Ernesto, to Stars Stampaggio Resine Speciali S.p.A. Breaksun shield operating as a collector. 4,191,165, Cl. 126-445.000.
Faull, James K. Rocker fixtures. 4,191,355, Cl. 248-594.000.
Feaster, Donavon L., to Sonitronics, Inc. Miniature switches. 4,191,867, Cl. 200-16.00R.
Federal Screw Works: *See*—
Strand, Norman S., 4,191,677, Cl. 260-37.0EP.
Feldmuhle Aktiengesellschaft: *See*—
Dessauer, Guido; Riecke, Kurt; and Land, Ferdinand, 4,191,403, Cl. 282-27.500.
Fenton, John W. Tool assembly. 4,191,228, Cl. 145-50.00A.
Fermi, Rudy; Pickard, John; Kocsis, Alex; Bratton, David; and Kasner, Gerald, to K and Manufacturing Company, Inc. Printing plate clamping assembly. 4,191,106, Cl. 101-415.100.
Ferrara, Rudolph A., to General Motors Corporation. Vehicle seat. 4,191,417, Cl. 296-65.00R.
Ferri, Johann W., to Luwa AG. Shutoff device. 4,191,358, Cl. 251-5.000.
Ferrini, Francesco: *See*—
Arrigoni, Virgilio; Ercolani, Dario; and Ferrini, Francesco, 4,191,047, Cl. 73-61.400.
Ferris, Ray L.; and Marulic, Walter J., to Pullman Incorporated. Articulated railway car. 4,191,107, Cl. 105-4.00R.
Fiamm S.p.A. Fabbrica Italiana Accumulatori Motocarri Montecchio: *See*—
Frigo, Domenico, 4,191,944, Cl. 340-388.000.
Fiducia, Christopher S. Child's drinking container. 4,191,302, Cl. 220-1.00R.
Fieldcrest Mills, Inc.: *See*—
Boyer, Hugh J., 4,191,221, Cl. 139-426.00R.
Figalla, Zdenek: *See*—
Uruba, Vladimir; and Figalla, Zdenek, 4,191,375, Cl. 273-65.0EB.
Fikkers, John T. Garbage chute clearing device. 4,190,920, Cl. 15-104.050.
Finch, Walter G.: *See*—
McLean, William B., deceased, 4,191,346, Cl. 244-3.160.
Finger, Eugene P., to Curtis Instruments, Inc. Coulometric device for performing time integration. 4,192,009, Cl. 364-829.000.
Firebaugh, Dale C.: *See*—
Saarem, Myrl J.; Lovelace, Donald E.; Firebaugh, Dale C.; and Soukup, Dale F., 4,191,166, Cl. 126-430.000.
Fischer, Arthur H.; Strow, Lawrence E.; and Bolth, Franklin A., to Mineric Corporation. Flotation process with use of xanthogen chloropropyl formate reagents. 4,191,641, Cl. 209-166.000.

Fives-Cail Babcock: *See*—
Dambrine, Francis, 4,191,586, Cl. 106-100.000.
Fiziko-Teknichesky Institut Akademii Nauk Belorusskoi SSR: *See*—
Morgunsky, Evgeny I.; Sidorenko, Valery A.; and Plotnikov, Vladmir A., 4,191,075, Cl. 82-36.00R.
Fleck, Raymond N.: *See*—
Young, Donald C.; and Fleck, Raymond N., 4,191,620, Cl. 204-149.000.
Flex-o-lators, Inc.: *See*—
Mundell, Donald D., 4,191,424, Cl. 297-459.000.
Flippo, Robert V., to Sundstrand Corporation. Power drive unit. 4,191,094, Cl. 91-506.000.
Flossdorf, Josef; Schillig, Henning; and Schindler, Klaus-Peter, to Gesellschaft fur biotechnologische Forschung m.b.H. Interference optical sensing device for a centrifuge. 4,191,469, Cl. 356-23.000.
Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-Mei L., to American Cyanamid Company. Various-15-deoxy-16-hydroxy-16-ethynyl and 16-ethynylsubstituted prostaglandins. 4,191,699, Cl. 260-448.20D.
Foley, James W.: *See*—
Bloom, Stanley M.; Borror, Alan L.; and Foley, James W., 4,191,689, Cl. 548-207.000.
Ford Motor Company: *See*—
Mallick, Pankaj K.; and Raghupathi, Narasimhan, 4,191,718, Cl. 264-26.000.
Ryder, William C.; and Hobbs, John C., 4,191,441, Cl. 339-17.00F.
Smartt, Herschel B.; and Kovacs, Bela V., 4,191,563, Cl. 75-130.00R.
Stickels, Charles A.; and Janotik, Adam M., 4,191,599, Cl. 148-16.500.
Forney Engineering Company: *See*—
Holley, Thomas H.; and George, Robert J., 4,191,214, Cl. 137-630.200.
Forsheda Gummifabrik AB: *See*—
Svedberg, Lennart, 4,191,384, Cl. 277-1.000.
Fortner, John M.; and Kirkman, Richard T., to Owens-Illinois, Inc. Method and apparatus for forming glass containers. 4,191,548, Cl. 65-79.000.
Foster Wheeler Energy Corporation: *See*—
Stevens, William D., 4,191,133, Cl. 122-235.00R.
Foulletier, Louis: *See*—
Chabert, Pierre; and Foulletier, Louis, 4,191,666, Cl. 252-545.000.
Fowler, Albert L., to Hughes Microelectronics Limited. Vacuum sensor. 4,191,145, Cl. 123-117.00A.
Fox, Rosemary M., executrix: *See*—
Fox, Wayne L., deceased; and Fox, Rosemary M., executrix, 4,191,385, Cl. 277-3.000.
Fox, Stephen N. W.; Snook, Edward H.; and Stimson, Norman F., deceased (by Stimson, Verity S., personal representative), to General Motors Corporation. Gearshift linkages for tilt-car vehicles. 4,191,271, Cl. 180-77.0TC.
Fox, Wayne L., deceased; and by Fox, Rosemary M., executrix. Vacuum-sealed gas-bearing assembly. 4,191,385, Cl. 277-3.000.
Franetzki, Manfred; Prestele, Karl; and Funke, Helmut, to Siemens Aktiengesellschaft. Apparatus for infusion of liquids. 4,191,181, Cl. 128-213.00R.
Franke, Walter. Two-stroke engine with auxiliary fluid means. 4,191,141, Cl. 123-65.00A.
Frederiksen, Thomas M.: *See*—
Redfern, Thomas P.; Connolly, Joseph J.; and Frederiksen, Thomas M., 4,191,900, Cl. 307-355.000.
Frei, Heinz. Storage and transportation apparatus. 4,191,415, Cl. 294-67.00R.
Freiberger, Ronald D.; and Reprogle, Richard D., to General Motors Corporation. Vacuum toggle. 4,191,090, Cl. 91-52.000.
Freitag, Dieter: *See*—
Lindner, Christian; Suling, Carlhans; Bartl, Herbert; Schreckenberg, Manfred; Freitag, Dieter; and Konig, Klaus, 4,191,705, Cl. 260-463.000.
Frey, Christoph: *See*—
Jeanneret, Remy; Zwahlen, Gunther; Frey, Christoph; and Zographos, Georgios, 4,191,566, Cl. 430-31.000.
Fricker, Rene: *See*—
Gross, Rolf; and Fricker, Rene, 4,191,532, Cl. 8-21.00A.
Friedrich Kocks GMBH & Company: *See*—
Brauer, Hans; and Demny, Werner, 4,191,041, Cl. 72-235.000.
Friedrich Wilhelm Schwing GmbH: *See*—
Schwing, Friedrich, 4,191,513, Cl. 417-517.000.
Frigo, Domenico, to Fiamm S.p.A. Fabbrica Italiana Accumulatori Motocarri Montecchio. Electromagnetic sound generator and method of making same. 4,191,944, Cl. 340-388.000.
Fritsch, Werner; Stache, Ulrich; and Lindner, Ernst, to Hoechst Aktiengesellschaft. 1-Aryloxy-2-hydroxy-3-aminopropanes. 4,191,765, Cl. 424-248.530.
Fritz Eichenauer, Firma: *See*—
Meywald, Klaus; and Ohnmacht, Helmut, 4,191,880, Cl. 219-375.000.
Froess, Jacob; and Spector, George. Battery lock. 4,191,034, Cl. 70-258.000.
Fueyo, Albert, to Calco Manufacturing Company. Flap control circuitry. 4,191,347, Cl. 244-76.00A.
Fuji Photo Film Co., Ltd.: *See*—
Fuseya, Yoshiharu; Inoue, Atsuo; Hara, Hiroshi; and Ikeda, Tadashi, 4,191,576, Cl. 430-512.00V.
Okita, Tsutomu; Satou, Masami; Hibino, Noburo; Katoh, Kazunobu; and Sugiyama, Masatoshi, 4,191,679, Cl. 260-40.00R.
Toyama, Tadao; and Iwasaki, Masayuki, 4,191,573, Cl. 430-166.000.
Fujii, Akira: *See*—
Cook, Elton S.; and Fujii, Akira, 4,191,779, Cl. 424-319.000.
Fujiki, Makoto, to Canon Kabushiki Kaisha. Camera with automatic focus adjustment device. 4,191,460, Cl. 354-25.000.
Fujisawa Pharmaceutical Co., Ltd.: *See*—
Kamiya, Takashi; Teraji, Tsutomu; Hashimoto, Masashi; Nakaguti, Osamu; and Oku, Teruo, 4,191,762, Cl. 424-246.000.
Fujita, Yoshiki: *See*—
Miki, Toshio; Fujita, Yoshiki; and Kawakami, Yoshihisa, 4,191,432, Cl. 308-187.000.
Fujitsu Limited: *See*—
Zasio, John J.; and Samuels, Michael W., 4,191,916, Cl. 318-640.000.
Fukui, Yoshio; Shiroto, Yoshimi; Ando, Mamoru; and Homma, Yasumasa, to Chiyoda Chemical Engineering & Construction Co., Ltd. Process for hydrotreating heavy hydrocarbon oil. 4,191,636, Cl. 208-110.000.
Funke, Helmut: *See*—
Franetzki, Manfred; Prestele, Karl; and Funke, Helmut, 4,191,181, Cl. 128-213.00R.
Funke, Ludwig F. Closure. 4,191,315, Cl. 222-553.000.
Funke, Ludwig F. Refrigerator storage system. 4,191,437, Cl. 312-305.000.
Furkawa, Hisao: *See*—
Yonezawa, Kazuya; Kato, Yasushi; Furkawa, Hisao; and Azuma, Masaaki, 4,191,713, Cl. 525-102.000.
Furman, Anthony H., to General Electric Company. Coal extrusion apparatus and process. 4,191,535, Cl. 44-10.00R.
Furukawa, Hisao: *See*—
Yonezawa, Kazuya; Kato, Yasushi; Furukawa, Hisao; and Azuma, Masaaki, 4,191,714, Cl. 525-102.000.
Furumoto, Mitsunobu; Yano, Osahiko; Kikuya, Satoshi; Kubo, Kanji; and Sakumoto, Hideki, to Matsushita Electric Industrial Co., Ltd. Method for adjusting rotary head type magnetic video recording and reproducing apparatus. 4,191,978, Cl. 360-75.000.
Fuseya, Yoshiharu; Inoue, Atsuo; Hara, Hiroshi; and Ikeda, Tadashi, to Fuji Photo Film Co., Ltd. Light-sensitive silver halide photographic element containing UV absorber. 4,191,576, Cl. 430-512.00V.
Futer, Rudolph E., to Futerized Systems, Inc. Live storage system. 4,191,499, Cl. 406-34.000.
Futerized Systems, Inc.: *See*—
Futer, Rudolph E., 4,191,499, Cl. 406-34.000.
Fuzzell, Joe E., to Caterpillar Tractor Co. Device for sensing fluid forces. 4,191,951, Cl. 340-610.000.
Gabus, Jean-Claude, to Carba S.A. Analogical control device for a typewriting machine to be used by handicapped persons. 4,191,481, Cl. 400-87.000.
GAF Corporation: *See*—
Kliegman, Jonathan M., 4,191,555, Cl. 71-95.000.
GALA, narodni podnik: *See*—
Uruba, Vladimir; and Figalla, Zdenek, 4,191,375, Cl. 273-65.0EB.
Galdos, Alberto T.: *See*—
Rivacoba, Jose U.; and Galdos, Alberto T., 4,191,495, Cl. 405-195.000.
Gambro AB: *See*—
Andersson, Roland J. E.; Larsson, Lars-Ake L.; and Traven, Lars J. C., 4,191,359, Cl. 251-9.000.
Larsson, Lars-Ake L.; and Traven, Lars J. C., 4,191,646, Cl. 210-103.000.
Gandini, Mario, to Durst A.G. Fabrik Fototechnischer Apparate. Illuminating system for color enlargement or copying equipment. 4,191,466, Cl. 355-35.000.
Ganellin, Charon R.: *See*—
Durant, Graham J.; Ganellin, Charon R.; and Young, Rodney C., 4,191,769, Cl. 424-263.000.
Gant, Preston L.: *See*—
Albright, James C.; and Gant, Preston L., 4,191,883, Cl. 250-259.000.
Garbarino, Paul L.; Revitz, Martin; and Shepard, Joseph F., to International Business Machines Corporation. Making semiconductor structure with improved phosphosilicate glass isolation. 4,191,603, Cl. 148-187.000.
Garbuny, Max: *See*—
Phillips, David C.; and Garbuny, Max, 4,191,622, Cl. 204-159.220.
Gardiner, Arthur L.; and Castillo, Tomas R., to United States of America, Army. Ammunition feeder having two feed pawls. 4,191,088, Cl. 89-33.00C.
Gardner, Lawrence R., to Chicago Bridge & Iron Company. Chain drive and automatic chain tensioning unit. 4,191,062, Cl. 74-242.11R.
Garner, Albert Y.: *See*—
Wu, Chester C.; and Garner, Albert Y., 4,191,715, Cl. 260-927.00N.
Garrison, Robert L.: *See*—
Bouchard, Andre C.; Morris, James C.; and Garrison, Robert L., 4,191,947, Cl. 340-531.000.
Garven, David H.: *See*—
Berner, John M., 4,190,972, Cl. 37-43.00D.
Garvey, Louis P.; and Rhamstine, Chester F., to General Motors Corporation. Vehicle occupant restraint system. 4,191,399, Cl. 280-806.000.
Gautier, Pieter A.: *See*—
Kwantes, Arien; and Gautier, Pieter A., 4,191,843, Cl. 568-728.000.
Geaslin, William E., to Solartech Systems Corporation. Single-pipe hot water solar system. 4,191,329, Cl. 126-427.000.
Gebruder Weiss K.G.: *See*—
Kneer, Franz X., 4,191,643, Cl. 210-4.000.

Gebrueder Buehler AG: *See—*
Stillhard, Bruno; and Naf, Hans, 4,191,726, Cl. 264-517.000.
Gelenkwellenbau GmbH: *See—*
Schultenkamper, Josef, 4,191,487, Cl. 403-337.000.
Gelfand, Mikhail L.: *See—*
Antipov, Georgy A.; Gelfand, Mikhail L.; Lavnikov, Nikolai S.; Teres, Leonid N.; Urazhdin, Ivan I.; Tsipenjuk, Yakov I.; and Yakubovsky, Petr S., 4,191,264, Cl. 173-93.600.
Geluk, Ronald J., to N.V. Optische Industrie "De Oude Delft". Synthetic aperture scanner for decoding a coded image produced by penetrating radiation, such as X-rays. 4,191,890, Cl. 250-402.000.
Gene Conreaux & Co., Inc.: *See—*
Carter, Donald S., 4,191,578, Cl. 106-1.130.
General Bathroom Products, Inc.: *See—*
Palka, James J., 4,190,929, Cl. 16-169.000.
General Dynamics Corporation Pomona Division: *See—*
MacTurk, William L., 4,191,604, Cl. 156-245.000.
General Electric Company: *See—*
Baliga, Bantval J., 4,191,602, Cl. 148-171.000.
Coker, Thomas G.; Dempsey, Russell M.; and LaConti, Anthony B., 4,191,618, Cl. 204-98.000.
Dixon, Robert P.; and Shannon, Francis T., 4,191,925, Cl. 325-474.000.
Furman, Anthony H., 4,191,535, Cl. 44-10.00R.
Haaf, William R.; and Lee, Gim F., Jr., 4,191,685, Cl. 260-45.95G.
James, Reginald S.; Grier, Thomas M.; and Schmidt, Robert D., 4,190,961, Cl. 33-180.00R.
Pasco, Wayne D.; and Klug, Frederic J., 4,191,720, Cl. 264-43.000.
Pasco, Wayne D.; Klug, Frederic J.; and Prochazka, Svante, 4,191,721, Cl. 264-43.000.
Powell, John M.; and Keeling, K. Bailey, Jr., 4,191,434, Cl. 312-214.000.
Smith, Donald F.; and Ostrelich, Michael J., 4,191,444, Cl. 339-107.000.
Uzgiris, Egidijus E.; and De Blois, Ralph W., 4,191,739, Cl. 424-12.000.
Webb, William M., 4,191,025, Cl. 62-135.000.
Wendt, Michael E.; and Beaver, Danny D., 4,191,245, Cl. 165-69.000.
General Foods Corporation: *See—*
Schara, Robert E.; Keenberg, Larry E.; and Makar, Andrew, 4,191,781, Cl. 426-2.000.
General Instrument Corporation: *See—*
Stamm, Russell D., 4,191,058, Cl. 74-10.330.
General Motors Corporation: *See—*
Ballantyne, David B., 4,191,409, Cl. 285-189.000.
Barnett, Ronald R., 4,191,392, Cl. 280-740.000.
Ferrara, Rudolph A., 4,191,417, Cl. 296-65.00R.
Fox, Stephen N. W.; Snook, Edward H.; and Stimson, Norman F., deceased, 4,191,271, Cl. 180-77.0TC.
Freiberger, Ronald D.; and Reprogle, Richard D., 4,191,090, Cl. 91-52.000.
Garvey, Louis P.; and Rhamstine, Chester F., 4,191,399, Cl. 280-806.000.
Jones, John E., 4,191,014, Cl. 60-290.000.
Reed, James, R.; Way, Terrance; and Leal, Richard A., 4,191,126, Cl. 118-50.000.
Siewert, Robert M., 4,191,150, Cl. 123-119.00B.
Sweeney, Ralph B.; and Verdouw, Albert J., 4,191,011, Cl. 60-39.320.
Walch, Robert L., Jr.; Carey, Van P.; and Thomas, Michael J., 4,191,172, Cl. 126-421.000.
Wanamaker, Joseph L., 4,191,151, Cl. 123-119.0EC.
General Tire & Rubber Company, The: *See—*
Gruber, David P., 4,191,799, Cl. 428-96.000.
Genter, Claude: *See—*
Koehler, Gerard; Aguettaz, Jean; Berthelot, Alain; Genter, Claude; and Arnoux, Daniel, 4,191,937, Cl. 335-230.000.
George, Robert J.: *See—*
Holley, Thomas H.; and George, Robert J., 4,191,214, Cl. 137-630.200.
Gerry, Martin E. AC power generation control system. 4,191,911, Cl. 315-209.00R.
Gerry, Martin E. Distributorless ignition system. 4,191,912, Cl. 315-209.00R.
Gersch, Dietfried, to Kessler & Luch GmbH. Nozzle for air conditioning units. 4,191,098, Cl. 98-40.00N.
Gerzon, Koert: *See—*
Conrad, Robert A.; Cullinan, George J.; Miller, Jean C.; and Gerzon, Koert, 4,191,688, Cl. 260-244.400.
Gesellschaft fur biotechnologische Forschung m.b.H.: *See—*
Flossdorf, Josef; Schillig, Henning; and Schindler, Klaus-Peter, 4,191,469, Cl. 356-23.000.
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Poklekowski, Helmut; Seeberger, Klaus; and Harmsma, Gunther, 4,191,497, Cl. 405-296.000.
Weirich, Walter; and Rosenberg, Harry, 4,191,498, Cl. 405-302.000.
Gibbons, Robert R.: *See—*
Halls, Kenneth F.; and Gibbons, Robert R., 4,191,589, Cl. 134-21.000.
Gibson, George W., to Applied Magnetics Corporation. Thin film magnetic head assembly having a thin film magnetic transducer encapsulated in insulating bonding material. 4,191,983, Cl. 360-125.000.
Gibson, James D. M.; and Hageman, Paul, to Wool Development International Limited. Method of forming a durable crease. 4,191,793, Cl. 427-276.000.
Gilbert, Lawrence A.: *See—*
Halas, Linda A.; Gilbert, Lawrence A.; Staab, Robert A.; Collins, Royal D.; and Ries, Charles R., 4,191,661, Cl. 252-103.000.
Girguis, Sobhy L.; and Krude, Werner, to Uni-Cardan Aktiengesellschaft. Swivel joint. 4,191,031, Cl. 64-21.000.
Gitlitz, Melvin H.; and Engelhart, John E. Tricyclopentyltin fluoride. 4,191,698, Cl. 260-429.700.
Givens, Edwin N.: *See—*
Plank, Charles J.; Rosinski, Edward J.; and Givens, Edwin N., 4,191,638, Cl. 208-139.000.
Glashagel, Barry B.: *See—*
LeCaire, Robert A., Jr.; and Glashagel, Barry B., 4,191,307, Cl. 221-45.000.
Gleasman, Vernon E.; and Benjamin, Robert N. Torque equalizer or unbalancer for a cross-axis planetary differential gear complex. 4,191,071, Cl. 74-715.000.
Glen, Alasdair T., to Imperial Chemical Industries Limited. Amide derivatives. 4,191,775, Cl. 424-304.000.
Gloriod, Pierre, to Societe Chimique des Charbonnages - CdF Chimie. Process for purifying recirculating gases of condensed polymer particles. 4,191,821, Cl. 528-501.000.
Gmuer, Bruno; and Grundbacher, Willy. Bag folding apparatus. 4,191,004, Cl. 53-378.000.
Goldberg, Jerome; and Bloch, Christopher D., to Spring Hill Laboratories, Inc. Adjusting automobile suspension system. 4,191,274, Cl. 180-282.000.
Goldman, Max; and Alexoff, Carl, to Systems Operations, Inc. Highly secure playing cards for instant lottery and games. 4,191,376, Cl. 273-139.000.
Goldner, Walther, to Recaro GmbH & Co. Headrest for vehicles. 4,191,423, Cl. 297-408.000.
Golobay, Gary L.; Deubner, Ted E.; and Beugelsdyk, Anthony F. Throttle twist grip. 4,191,065, Cl. 74-489.000.
Gonner, Winfried K., to Bodenseewerk Perkin-Elmer & Co., GmbH. Digital fluid flow rate controller. 4,191,215, Cl. 137-870.000.
Gonzalez, Raymond J.: *See—*
Knox, William A.; and Gonzalez, Raymond J., 4,191,946, Cl. 340-506.000.
Goodman Systems, Inc., The: *See—*
Goodman, Toronta P., 4,191,134, Cl. 123-25.00J.
Goodman, Toronta P., to Goodman Systems, Inc., The. Fluid injection system and method for an internal combustion engine. 4,191,134, Cl. 123-25.00J.
Gorin, Everett, to Continental Oil Company. Synthetic CO_2 acceptor and gasification process therewith. 4,191,538, Cl. 48-197.00R.
Gorman, Marvin; Higgens, Calvin E.; and Nagarajan, Ramakrishnan, to Eli Lilly and Company. Antibiotic A16886 and process for production thereof. 4,191,763, Cl. 424-246.000.
Gorondy, Emery J.: *See—*
Edwards, Donald W.; Gorondy, Emery J.; and van Roggen, Arend, 4,191,961, Cl. 346-74.100.
Gottesfeld, Shimshon: *See—*
Beni, Gerardo; Gottesfeld, Shimshon; McIntyre, James D. E.; and Shay, Joseph L., 4,191,453, Cl. 350-357.000.
Gottlieb, Sheldon K. Method for promoting growth of new connective tissue over surface wounds. 4,191,751, Cl. 424-177.000.
Gould Inc.: *See—*
Busta, Heinz H., 4,191,057, Cl. 73-777.000.
Gould, Marc I., to Rockwell International Corporation. Sodium purification apparatus and method. 4,191,558, Cl. 75-66.000.
Gould, Penelope L.: *See—*
Burkwall, Morris P., Jr.; and Gould, Penelope L., 4,191,783, Cl. 426-335.000.
Gould, Walter M. Method of molding a composite synthetic resin foam roofing structure having an integral skin thereon. 4,191,722, Cl. 264-45.500.
Gow, John, 3rd; Hoffman, Herman S.; and Stephans, Earl, to International Business Machines Corporation. Cermet resistor trimming method. 4,191,938, Cl. 338-195.000.
Goyne, Thomas E., to Cobe Laboratories, Inc. Mounting fluid flow apparatus. 4,191,351, Cl. 248-311.10R.
Grafen, Paul; Kroesche, Henning; Schulz, Bernhard; Paust, Joachim; and Pfohl, Sigberg, to BASF Aktiengesellschaft. Manufacture of tocopherol. 4,191,692, Cl. 260-345.500.
Graham, Lawrence L. Apparatus for punching storm sashes. 4,191,080, Cl. 83-467.00R.
Grana, David C.; and Wilem, Richard T., to United States of America, National Aeronautics and Space Administration. Natural turbulence electrical power generator. 4,191,893, Cl. 290-53.000.
Graves, Wayne H.: *See—*
Bradley, William E.; Timm, Gerald W.; Klatt, William M.; and Graves, Wayne H., 4,191,196, Cl. 128-733.000.
Great Circle Associates: *See—*
Mullerheim, Steven B.; and Williams, Fred G., Jr., 4,191,647, Cl. 210-128.000.
Gregory, Walter A., to Du Pont de Nemours, E. I., and Company. Herbicidal benzamides. 4,191,554, Cl. 71-95.000.
Greiner, Hans-Joachim: *See—*
Amtmann, Heribert; Ebersberger, Hans; Eckardt, Guenter; and Greiner, Hans-Joachim, 4,191,891, Cl. 250-402.000.
Grier, Thomas M.: *See—*
James, Reginald S.; Grier, Thomas M.; and Schmidt, Robert D., 4,190,961, Cl. 33-180.00R.

Grigorenko, Anatoly S.; Moroz, Jury A.; Kortusov, Leonid I.; Bocharov, Jury A.; and Safonov, Anatoly V. Hydraulic screw press. 4,191,044, Cl. 72-354.000.

Grinberg, Jan; Braatz, Paul O.; Waldner, Michael; and Jacobson, Alexander D., to Hughes Aircraft Company. AC silicon PN junction photodiode light-valve substrate. 4,191,452, Cl. 350-342.000.

Grinberg, Jan: *See*—
Braatz, Paul O.; Grinberg, Jan; Jacobson, Alexander D.; and Waldner, Michael, 4,191,454, Cl. 350-342.000.

Grisham, William P., Jr., to Shell Oil Company. Dewaxing process. 4,191,631, Cl. 208-33.000.

Grist, Dennis M.: *See*—
Buckley, Peter S.; and Grist, Dennis M., 4,191,252, Cl. 166-272.000.

Groen, Don L. Air deflector for motor vehicles. 4,191,097, Cl. 98-2.120.

Groothuis, Hermanus H. H., to U.S. Philips Corporation. Device for the display of data on a display apparatus. 4,191,956, Cl. 340-789.000.

Gross, Harvey A.: *See*—
Morin, Wilfred F.; Martini, Joseph A.; Marich, Peter; and Gross, Harvey A., 4,191,378, Cl. 273-162.00R.

Gross, Rolf; and Fricker, Rene, to Sandoz Ltd. Organic compounds. 4,191,532, Cl. 8-21.00A.

Gruber, David P., to General Tire & Rubber Company, The. Bonding carpet backing using a latex extended with grafted mineral oil. 4,191,799, Cl. 428-96.000.

Gruber, Werner: *See*—
Woog, Heinrich; and Gruber, Werner, 4,191,772, Cl. 424-273.00R.

Grudkowski, Thomas W.: *See*—
Montress, Gary K.; Grudkowski, Thomas W.; and Reeder, Thomas M., 4,191,933, Cl. 333-151.000.

Grudzinskas, Charles V.: *See*—
Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-Mei L., 4,191,699, Cl. 260-448.20D.

Grumman Aerospace Corporation: *See*—
Courten, Henry C.; and Mattal, Joseph P., 4,191,471, Cl. 356-154.000.

Grundbacher, Willy: *See*—
Gmuer, Bruno; and Grundbacher, Willy, 4,191,004, Cl. 53-378.000.

Grupping, Arnold W. J.: *See*—
van Eek, Wouter H.; and Grupping, Arnold W. J., 4,191,266, Cl. 175-17.000.

Grycel, Felix J. Model sailboat sheet winch. 4,190,980, Cl. 46-93.000.

GTE Automatic Electric Laboratories Incorporated: *See*—
McLaughlin, Donald W., 4,191,857, Cl. 179-15.0BY.
Sabon, Robert J., 4,191,859, Cl. 179-18.0FA.
Vrba, James J., 4,191,849, Cl. 178-69.100.

GTE Sylvania Incorporated: *See*—
Bouchard, Andre C.; Morris, James C.; and Garrison, Robert L., 4,191,947, Cl. 340-531.000.
Buescher, William E.; Roberto, Frederick J.; and Sobierajski, Isabelle M., 4,191,577, Cl. 106-1.120.
Mathers, James E.; and Yale, Ramon L., 4,191,662, Cl. 252-301.40R.

Guinosso, Charles J.: *See*—
Sellstedt, John H.; Guinosso, Charles J.; and Begany, Albert J., 4,191,840, Cl. 562-453.000.

Guise, Geoffrey B.; and White, Maxwell A., to Commonwealth Scientific and Industrial Research Organization. Coating of fibrous materials with compositions containing mixtures of polycarbamoyl sulphonates and other polymers. 4,191,802, Cl. 428-375.000.

Gulf Chemical & Metallurgical Co.: *See*—
Wright, Peter A., 4,191,560, Cl. 75-85.000.

Gulf Research and Development Company: *See*—
Swift, Harold E.; Madgavkar, Ajay M.; and Vogel, Roger F., 4,191,733, Cl. 423-245.000.

Guttenplan, Jack D.; and Yancey, Herbert W., to Rockwell International Corporation. Instrument for detecting contamination on metallic surfaces by measuring surface potential differences. 4,191,920, Cl. 324-459.000.

H & L Co.: *See*—
Hulland, Burton L.; and Litchford, George B., 4,191,958, Cl. 343-105.00R.

Haaf, William R.; and Lee, Gim F., Jr., to General Electric Company. Composition of polyphenylene ether, aromatic phosphate, aromatic halogen compound and impact modifier comprising diene polymer. 4,191,685, Cl. 260-45.95G.

Haag, Wilhelm: *See*—
Dolling, Ludvik; Haag, Wilhelm; and Heindze, Herbert, 4,191,213, Cl. 137-625.170.

Haarmann, Walter: *See*—
Nickl, Josef; Muller, Erich; Narr, Berthold; Haarmann, Walter; Schroter, Wolfgang; and Kadatz, Rudolf, 4,191,776, Cl. 424-308.000.

Habermeier, Jurgen; and Moser, Roland, to Ciba-Geigy Corporation. Bis-anthranilates of urea derivatives. 4,191,835, Cl. 560-49.000.

Habermeier, Jurgen; and Moser, Roland, to Ciba-Geigy Corporation. Anthranilates of polyoxyethylated carboxylic acid. 4,191,836, Cl. 560-49.000.

Hablanian, Marsbed: *See*—
O'Neal, Charles D., III; Blumle, Leo J.; and Hablanian, Marsbed, 4,191,512, Cl. 417-54.000.

Hafner, Leroy A.: *See*—
Beiter, Charles B.; and Hafner, Leroy A., 4,191,580, Cl. 106-16.000.

Hagar, Donald K., to Damper Design, Inc. Multiple blade damper assembly. 4,191,212, Cl. 137-601.000.

Hageman, Paul: *See*—
Gibson, James D. M.; and Hageman, Paul, 4,191,793, Cl. 427-276.000.

Hagen, Klaus: *See*—
Bernhardt, Jost; Hase, Georg; Hase, Peter; and Hagen, Klaus, 4,191,310, Cl. 222-5.000.

Hahn, Norbert: *See*—
Neff, Robert O.; White, Arthur K.; and Hahn, Norbert, 4,191,503, Cl. 414-401.000.

Hails, George; and Symonds, John D., to International Paint Company Limited, The. Antifouling paint comprising a copolymer containing organo tin salt and a pigment having a component which reacts with sea water and another component which does not react with sea water. 4,191,579, Cl. 106-15.00R.

Halas, Linda A.; Gilbert, Lawrence A.; Staab, Robert A.; Collins, Royal D.; and Ries, Charles R., to Procter & Gamble Company, The. Alkaline dishwasher detergent. 4,191,661, Cl. 252-103.000.

Halcon Research and Development Corp.: *See*—
Leacock, James, 4,191,710, Cl. 260-601.00R.

Hall, Wilbur S., to Union Carbide Corporation. Autodeposition process and composition. 4,191,676, Cl. 260-29.70R.

Halliburton Company: *See*—
Baker, Eugene E.; and Carter, Ernest E., Jr., 4,191,383, Cl. 277-1.000.

Halls, Kenneth F.; and Gibbons, Robert R., to John J. Sundheim Family Estate, The, a part interest. Method and apparatus for cleaning carpets and surfaces using cleaning fluid. 4,191,589, Cl. 134-21.000.

Hamilton, Artimus C., to Congoleum Corporation. Aqueous-alcoholic, foam-growth-controlling printing ink compositions. 4,191,581, Cl. 106-20.000.

Hammerli, Martin; and Butler, John P., to Atomic Energy of Canada Limited. Apparatus for finishing and upgrading of heavy water. 4,191,626, Cl. 204-266.000.

Hammes, Alvin T.: *See*—
Allen, James R.; and Hammes, Alvin T., 4,191,308, Cl. 221-202.000.

Hammett, Roy: *See*—
Blake, William S.; and Hammett, Roy, 4,191,313, Cl. 222-335.000.

Hampton, Quentin L. Self washing belt strainer. 4,191,653, Cl. 210-396.000.

Hampton, Ralph C. Locator for vertical reinforcing bars. 4,190,999, Cl. 52-687.000.

Haney, Richard M.; Stillman, Robert A.; and Codrington, Robert S., to Varian Associates, Inc. Fast NMR acquisition processor. 4,191,919, Cl. 324-312.000.

Hannen, Martin R.; and Charlesworth, David V. Tactile indicating device. 4,191,945, Cl. 340-407.000.

Hansch, Theodor W. Method of and apparatus for measuring the absolute wavelength of a source of unknown frequency radiation. 4,191,473, Cl. 356-300.000.

Hansen, William A.; and Conly, William A. Glasswasher. 4,191,592, Cl. 134-48.000.

Hansson, Knut; and Larson, Lars, to Aktiebolaget Platmanufaktur. Method for the production of a cavity limited by a flexible material. 4,191,493, Cl. 405-150.000.

Hara, Hiroshi: *See*—
Fuseya, Yoshiharu; Inoue, Atsuo; Hara, Hiroshi; and Ikeda, Tadashi, 4,191,576, Cl. 430-512.00V.

Haraguchi, Keisuke: *See*—
Urano, Fumio; Haraguchi, Keisuke; and Arai, Akihiro, 4,191,463, Cl. 354-217.000.

Hardman, Olin A. Support and cover restraining device for refuse containers. 4,191,297, Cl. 211-83.000.

Harkins, Lane J. Toilet paper unrolling fixture. 4,191,317, Cl. 225-77.000.

Harmsma, Gunther: *See*—
Poklekowski, Helmut; Seeberger, Klaus; and Harmsma, Gunther, 4,191,497, Cl. 405-296.000.

Harrell, John B.; Barraclough, William F.; and Pederson, Curtis O., to Salem Furnace Co. Furnace for heating solids. 4,191,529, Cl. 432-98.000.

Harrington, Alan L., to TRW Inc. Method to reduce breakage of V-grooved <100> silicon substrate. 4,191,788, Cl. 427-82.000.

Harris, Richard M.; and Janos, Wilbert J., to Republic Steel Corporation. Electromagnetic flaw detection system and method incorporating improved automatic coil error signal compensation. 4,191,922, Cl. 324-225.000.

Harris Semiconductor: *See*—
Taylor, David L., 4,192,016, Cl. 365-163.000.

Harry Bickerton Limited: *See*—
Bickerton, Harry, 4,191,488, Cl. 403-370.000.

Hart Schaffner & Marx: *See*—
Broudy, Charles E., 4,191,298, Cl. 211-126.000.

Hart, William B.; and Williams, Reginald T., to Delta Materials Research Limited. Temperature-responsive actuator. 4,191,053, Cl. 73-363.100.

Hartmann, Werner: *See*—
Schindler, Rudolf; and Hartmann, Werner, 4,190,996, Cl. 52-309.130.

Hartwick, Richard A. Liquid chromatography system with simulated gradient. 4,191,649, Cl. 210-198.00C.

Harvell, Glenn M. Combination folding cushion and carrying assembly. 4,190,918, Cl. 5-465.000.

Harzer, Peter, to Wandel u. Goltermann GmbH & Co. Digitally settable frequency generator. 4,191,930, Cl. 331-1.00A.

Hase, Georg: *See*—
Bernhardt, Jost; Hase, Georg; Hase, Peter; and Hagen, Klaus, 4,191,310, Cl. 222-5.000.
Hase, Peter: *See*—
Bernhardt, Jost; Hase, Georg; Hase, Peter; and Hagen, Klaus, 4,191,310, Cl. 222-5.000.
Hasegawa, Gary K.; and Mascia, Carmen T., to Continental Group, Inc., The. Container opener and method of utilizing the same. 4,190,957, Cl. 30-411.000.
Hashimoto, Masashi: *See*—
Kamiya, Takashi; Teraji, Tsutomu; Hashimoto, Masashi; Nakaguti, Osamu; and Oku, Teruo, 4,191,762, Cl. 424-246.000.
Haslinger, Leopold; and Krenn, Josef, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Duct-mounted turbine and method of installing the same. 4,191,504, Cl. 415-1.000.
Hassell, David A.: *See*—
Ahlgren, David W.; Hassell, David A.; and Zimmer, Elvis S., 4,191,881, Cl. 219-388.000.
Hastings, John A. Earlobe piercing instrument holder. 4,191,190, Cl. 128-330.000.
Hata, Kunio: *See*—
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Hatano, Yoshio: *See*—
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Hatch, George, to Combi-Lock Enterprises Limited. Lock. 4,191,035, Cl. 70-298.000.
Hausdorff, Harry H. Portable travel expense tabulator. 4,192,006, Cl. 364-715.000.
Hawkins, Edwin F.; and Parham, Thomas M., Jr., to Allied Chemical Corporation. Storage-stable nitrogen-magnesium foliar spray compositions. 4,191,550, Cl. 71-30.000.
Hayasaka, Kuniyuki; and Tamaoka, Yutaka, to Honny Chemicals Company, Limited. Method of producing microporous films. 4,191,623, Cl. 204-180.00R.
Haynes, John R., to Head, Johnson & Chafin, Inc. Welding torch holder. 4,191,362, Cl. 266-48.000.
Haynes, Larry E.: *See*—
Ely, Richard H.; and Haynes, Larry E., 4,191,514, Cl. 417-529.000.
Hayward, Glenn L., to Burd, Inc. Heat and electrical resistant table and bench top and method of making same. 4,191,797, Cl. 428-50.000.
Hazeltine Corporation: *See*—
Lopez, Alfred R., 4,191,960, Cl. 343-854.000.
Head, Johnson & Chafin, Inc.: *See*—
Haynes, John R., 4,191,362, Cl. 266-48.000.
Headrick, J. Charles; Peel, Robert C.; and Starnes, R. Emory, to Southwire Company. Galvanized tube welded seam repair metallizing process. 4,191,319, Cl. 228-147.000.
Heindze, Herbert: *See*—
Dolling, Ludvik; Haag, Wilhelm; and Heindze, Herbert, 4,191,213, Cl. 137-625.170.
Heine, Josef: *See*—
Meyer, Fritz; Heine, Josef; and Vig, Ladislav, 4,191,277, Cl. 187-29.00R.
Heinemann, Henning: *See*—
Liepmann, Hans; Hueschens, Rolf; Milkowski, Wolfgang; Zeugner, Horst; Heinemann, Henning; Wolf, Klaus-Ullrich; Hell, Insa; and Hempel, Reinhard, 4,191,770, Cl. 424-266.000.
Helbling, Clements A., Jr.: *See*—
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Helgers, Manfred: *See*—
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Liepmann, Hans; Hueschens, Rolf; Milkowski, Wolfgang; Zeugner, Horst; Heinemann, Henning; Wolf, Klaus-Ullrich; Hell, Insa; and Hempel, Reinhard, 4,191,770, Cl. 424-266.000.
Hemotherapy Inc.: *See*—
Popovich, Robert P.; Antwiler, Glen D.; and Moncrief, Jack W., 4,191,182, Cl. 128-214.00R.
Hempel, Reinhard: *See*—
Liepmann, Hans; Hueschens, Rolf; Milkowski, Wolfgang; Zeugner, Horst; Heinemann, Henning; Wolf, Klaus-Ullrich; Hell, Insa; and Hempel, Reinhard, 4,191,770, Cl. 424-266.000.
Henderson, Larry R., to Timjoist, Inc. Wooden I-beam. 4,191,000, Cl. 52-729.000.
Hensley, Albert L., Jr.: *See*—
Quick, Leonard M.; and Hensley, Albert L., Jr., 4,191,635, Cl. 208-89.000.
Hepperle, Erwin. Curtain rod track fitting. 4,190,927, Cl. 16-96.00D.
Herbert Kannegiesser Kommanditgesellschaft: *See*—
Niederst, Jean-Pierre; and Holzinger, Karl, 4,191,523, Cl. 425-589.000.
Herbert Zippel GmbH & Co., KG: *See*—
Zippel, Herbert, 4,191,484, Cl. 402-15.000.
Herman, Joseph L., to Joseph L. Herman Family Trust, The. Galvanizing apparatus for wire and the like. 4,191,127, Cl. 118-57.000.
Hermans, Johny C., to s.a. Texaco Belgium n.v. Bispiperazido phosphorus acid esters. 4,191,826, Cl. 544-337.000.
Herrick, Joseph R.: *See*—
Van Linden, Jan H. L.; Miller, Ronald E.; and Herrick, Joseph R., 4,191,559, Cl. 75-68.00R.
Hershey, Lowell E., to Durametallic Corporation. Self-cooled mechanical seal. 4,191,386, Cl. 277-22.000.
Herskind, Boris A. Convertible garment. 4,190,908, Cl. 2-213.000.
Herting, Hans-Peter; and Rebner, Wolfgang J., to Polychrome Corporation. Process for heat treating lithographic printing plates. 4,191,570, Cl. 430-302.000.
Heusser, Dietrich; and Dingeldein, Elvira, to Merck Patent Gesellschaft mit beschrankter Haftung. Synthetic resin-base, antibiotic compositions containing amino acids. 4,191,740, Cl. 424-14.000.
Hewlett-Packard Company: *See*—
Miller, Arthur, 4,191,195, Cl. 128-696.000.
Heyl, Walter, to Linde AG. Hollow piston for hydrostatic machines. 4,191,095, Cl. 92-78.000.
Hibino, Noburo: *See*—
Okita, Tsutomu; Satou, Masami; Hibino, Noburo; Katoh, Kazunobu; and Sugiyama, Masatoshi, 4,191,679, Cl. 260-40.00R.
Hickman, Charles E.; and Denwalt, William C., Jr., to Auto Crane Company. Rotation limiter. 4,191,301, Cl. 212-69.000.
Higgens, Calvin E.: *See*—
Gorman, Marvin; Higgens, Calvin E.; and Nagarajan, Ramakrishnan, 4,191,763, Cl. 424-246.000.
Hillmann, Hans. Machine with processing heads. 4,190,938, Cl. 29-26.00A.
Hinze, Adrien G.; and Stigter, Hendrik G., to Emery Industries, Inc. Polyamides. 4,191,669, Cl. 260-18.00N.
Hiorth, Hans, to Dyno Industrier A.S. Continuous flow static mixer for mixing powder and/or suspension materials with liquid materials. 4,191,480, Cl. 366-336.000.
Hirao, Yutaka; Hata, Kunio; and Hosoda, Masao, to Chuetsu Metal Works Co., Ltd. Brass having superior adhesion and wear resistant properties. 4,191,564, Cl. 75-157.500.
Hirata, Masuzo, to Toyo Seikan Co., Ltd. Guard-rail reflector. 4,191,449, Cl. 350-97.000.
Hirschberger, August: *See*—
Jardin, Hans; Hirschberger, August; and Isleif, Karl-Heinz, 4,191,068, Cl. 74-625.000.
Hitachi Chemical Company, Ltd.: *See*—
Katoh, Tetsuya, 4,191,803, Cl. 428-407.000.
Hitachi Kizai Kogyo Co. Ltd.: *See*—
Kuroda, Michio; Yamazaki, Yoshiaki; Namura, Kiyoshi; Kato, Fumio; Akatsu, Yasuaki; Morimoto, Daizo; and Ninomiya, Satoshi, 4,191,508, Cl. 416-196.00R.
Hitachi, Ltd.: *See*—
Honma, Makoto; and Inoue, Takao, 4,191,851, Cl. 179-1.0GD.
Kuroda, Michio; Yamazaki, Yoshiaki; Namura, Kiyoshi; Kato, Fumio; Akatsu, Yasuaki; Morimoto, Daizo; and Ninomiya, Satoshi, 4,191,508, Cl. 416-196.00R.
Nakamura, Shozo; Kuroda, Michio; and Oshima, Ryoichiro, 4,191,021, Cl. 60-657.000.
Nonogaki, Saburo; Kohashi, Takahiro; and Hatano, Yoshio, 4,191,571, Cl. 430-335.000.
Sakai, Hisao, 4,191,855, Cl. 179-2.00A.
Sato, Katsutoshi; Ito, Susumu; Kanaya, Tadashi; Onishi, Hiroaki; Ichiishi, Tsuneo; and Osaka, Akira, 4,191,286, Cl. 193-40.000.
Yanagisawa, Syozo; and Ishikawa, Shigewo, 4,191,870, Cl. 200-83.00P.
Hobart Corporation: *See*—
Katterheinrich, Fred H.; and Small, James R., 4,191,605, Cl. 156-285.000.
Hobbs, James W.: *See*—
Stewart, William S.; and Hobbs, James W., 4,191,511, Cl. 417-18.000.
Hobbs, John C.: *See*—
Ryder, William C.; and Hobbs, John C., 4,191,441, Cl. 339-17.00F.
Hodgdon, Russell B., to Ionics, Incorported. Ion exchange membranes based upon polyphenylene sulfide and fluorocarbon polymeric binder. 4,191,811, Cl. 521-27.000.
Hodges, Marvin P., to Marv Hodges, Inc. Projection screen and method of making same. 4,191,451, Cl. 350-126.000.
Hodosh, Milton. Method for treating canker sores. 4,191,750, Cl. 424-127.000.
Hoechst Aktiengesellschaft: *See*—
Fritsch, Werner; Stache, Ulrich; and Lindner, Ernst, 4,191,765, Cl. 424-248.530.
Steuernagel, Hans H.; and Hoyer, Ernst, 4,191,703, Cl. 260-458.00C.
Wiezer, Hartmut; Pfahler, Gerhard; Mayer, Norbert; and Knorr, Harald, 4,191,684, Cl. 260-48.5NT.
Hoehn, Hans, to E. R. Squibb & Sons, Inc. Imidazolylethoxy derivatives of pyridin-5-methanols. 4,191,831, Cl. 546-278.000.
Hoffman, Herman S.: *See*—
Gow, John, 3rd; Hoffman, Herman S.; and Stephans, Earl, 4,191,938, Cl. 338-195.000.
Hoffmann-La Roche Inc.: *See*—
Cohen, Noal; and Saucy, Gabriel, 4,191,842, Cl. 568-662.000.
Dixon, William R., 4,191,738, Cl. 424-1.000.
Dorn, Silvia, 4,191,773, Cl. 424-282.000.
Kompis, Ivan; and Wick, Alexander E., 4,191,758, Cl. 424-229.000.
Hogberg, Carl G. Table or stool of separable components. 4,191,113, Cl. 108-157.000.
Hoggan, Daniel H. Double clip lettering guide adjustment wedge. 4,191,450, Cl. 350-121.000.
Holden, Edward S., to Tube Engineers, Inc. Pressure gauge spring. 4,191,056, Cl. 73-743.000.

Holley, Thomas H.; and George, Robert J., to Forney Engineering Company. Sequential operating mechanism for valves. 4,191,214, Cl. 137-630.200.
Holmes, Vernon P.: *See—*
Orem, Donald E.; Holmes, Vernon P.; and Bacsanyi, Thomas J., 4,191,055, Cl. 73-462.000.
Holt, Billie E. Means for forming an edge-protected contraction. 4,190,997, Cl. 52-396.000.
Holtzman, Kenneth A., to Bell Telephone Laboratories, Incorporated. Devices employing flexible substrates and method for making same. 4,191,800, Cl. 428-251.000.
Holwerda-Huizenga Co.: *See—*
Holwerda, Sidney J., 4,191,348, Cl. 244-134.00C.
Holwerda, Sidney J., to Holwerda-Huizenga Co. Deicing system. 4,191,348, Cl. 244-134.00C.
Holzinger, Karl: *See—*
Niederst, Jean-Pierre; and Holzinger, Karl, 4,191,523, Cl. 425-589.000.
Holzmann, David. Novel medicinal composition, especially for the treatment of cellulitis. 4,191,748, Cl. 424-94.000.
Homma, Yasumasa: *See—*
Fukui, Yoshio; Shiroto, Yoshimi; Ando, Mamoru; and Homma, Yasumasa, 4,191,636, Cl. 208-110.000.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Nagashima, Tomoyuki; Tanaka, Masayuki; and Shinomiya, Shigeo, 4,191,269, Cl. 180-27.000.
Nishikawa, Masao; and Yamamoto, Hitoshi, 4,191,281, Cl. 188-319.000.
Honeywell Inc.: *See—*
Butter, Charles D., 4,191,470, Cl. 356-35.500.
Carmody, Joseph P., 4,191,998, Cl. 364-200.000.
Hong, Byung S.; Colles, Joseph H.; Scofield, David D.; Purdy, Stephen J.; and Reinsch, Stephen J., to Hughes Aircraft Company. Optical block for high brightness full color video projection system. 4,191,456, Cl. 353-31.000.
Honma, Makoto; and Inoue, Takao, to Hitachi, Ltd. FM Noise suppressor. 4,191,851, Cl. 179-1.0GD.
Honnen, Lewis R.: *See—*
Lewis, Robert A.; and Honnen, Lewis R., 4,191,537, Cl. 44-71.000.
Honny Chemicals Company, Limited: *See—*
Hayasaka, Kuniyuki; and Tamaoka, Yutaka, 4,191,623, Cl. 204-180.00R.
Hood, George A.: *See—*
Oberg, Carl L.; and Hood, George A., 4,191,500, Cl. 406-146.000.
Horace W. Longacre, Inc.: *See—*
Bauermann, Julius F., 4,191,787, Cl. 426-615.000.
Horgan, Stephen W.; Palopoli, Frank P.; and Wenstrup, David L., to Richardson-Merrell Inc. Process for preparing 2-(2,2-dicyclohexylethyl)piperidine. 4,191,828, Cl. 546-185.000.
Horrom, Bruce W.; and Barta, William D., to Abbott Laboratories. Dibenzodiazepines. 4,191,760, Cl. 424-244.000.
Hosobuchi, Fumio: *See—*
Matsuda, Genji; and Hosobuchi, Fumio, 4,191,369, Cl. 271-299.000.
Hosoda, Masao: *See—*
Hirao, Yutaka; Hata, Kunio; and Hosoda, Masao, 4,191,564, Cl. 75-157.500.
Hostad, Michael W., to Packaging Corporation of America. Shipper display unit. 4,191,288, Cl. 206-45.220.
Houk, Richard D.; and Jones, Marvin H., to Samuel Moore and Company. Lever control. 4,191,064, Cl. 74-475.000.
Hovmand, Svend: *See—*
Christensen, Mogens A.; Hovmand, Svend; Laursen, Jens K.; and Mortensen, Henrik B., 4,190,963, Cl. 34-57.00A.
Hoyer, Ernst: *See—*
Steuernagel, Hans H.; and Hoyer, Ernst, 4,191,703, Cl. 260-458.00C.
Huang, Sung-Cheng; Brunnett, Carl J.; and Mattson, Rodney A., to Picker Corporation. Spread beam overlap method. 4,191,892, Cl. 250-445.00T.
Hudgins, William C. Apparatus for the emergency pulling of small cables on motorcycles, boats and other small machinery. 4,190,928, Cl. 16-111.00R.
Hudson, James L.; and Wagner, Jack F., to Eli Lilly and Company. Removable drug implant. 4,191,741, Cl. 424-19.000.
Hudson, John A.: *See—*
Nelson, Richard S.; Hudson, John A.; and Mazey, David J., 4,191,735, Cl. 423-446.000.
Hudson Lock, Inc.: *See—*
Patriquin, George P., 4,191,037, Cl. 70-369.000.
Huebsch, Donald L.; and Paulos, Louis B. Tandem solenoid-controlled safety cut-off valve for a fluid well. 4,191,248, Cl. 166-65.00M.
Hueschens, Rolf: *See—*
Liepmann, Hans; Hueschens, Rolf; Milkowski, Wolfgang; Zeugner, Horst; Heinemann, Henning; Wolf, Klaus-Ullrich; Hell, Insa; and Hempel, Reinhard, 4,191,770, Cl. 424-266.000.
Hughes Aircraft Company: *See—*
Braatz, Paul O.; Grinberg, Jan; Jacobson, Alexander D.; and Waldner, Michael, 4,191,454, Cl. 350-342.000.
Grinberg, Jan; Braatz, Paul O.; Waldner, Michael; and Jacobson, Alexander D., 4,191,452, Cl. 350-342.000.
Hong, Byung S.; Colles, Joseph H.; Scofield, David D.; Purdy, Stephen J.; and Reinsch, Stephen J., 4,191,456, Cl. 353-31.000.
Hughes Microelectronics Limited: *See—*
Fowler, Albert L., 4,191,145, Cl. 123-117.00A.
Hughes, Raymond J., to Rolm Corporation. Dual frequency tone decoder. 4,191,862, Cl. 179-84.0VF.
Hulland, Burton L.; and Litchford, George B., to H & L Co. Radiolocation with respect to an Own station, using Omega signals or the like. 4,191,958, Cl. 343-105.00R.
Hunt, Claude J. L. Vacuum metallizing of hollow articles. 4,191,128, Cl. 118-720.000.
Hunzinger, Jean-Jacques: *See—*
Arditty, Herve; and Hunzinger, Jean-Jacques, 4,191,446, Cl. 350-96.150.
Hurley, John L.; Luch, Daniel; and Knipple, Charles J., to International Nickel Company, Inc., The. Process for electroplating directly plateable plastic with cobalt alloy strike and article thereof. 4,191,617, Cl. 204-40.000.
Hurt, Brian D. Fishing light. 4,190,976, Cl. 43-17.500.
Husqvarna AB: *See—*
Bergvall, Bengt A., 4,191,120, Cl. 112-158.00E.
Hutta, Joseph J.: *See—*
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Hydrocarbon Research, Inc.: *See—*
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Hylsa, S.A.: *See—*
Rodriguez, Federico A.; Becerra Novoa, Jorge; and Sanchez Ramirez, Julian, 4,191,885, Cl. 250-302.000.
Hyman, Mark, to Solar Heat Corporation. Solar energy panel. 4,191,169, Cl. 126-444.000.
Ichiishi, Tsuneo: *See—*
Sato, Katsutoshi; Ito, Susumu; Kanaya, Tadashi; Onishi, Hiroaki; Ichiishi, Tsuneo; and Osaka, Akira, 4,191,286, Cl. 193-40.000.
Ignatjev, Vladimir. Solar energy fluid heater. 4,191,167, Cl. 126-417.000.
Iio, Toshimitsu: *See—*
Nakajima, Kunihiko; Sato, Kyoshi; Iio, Toshimitsu; and Kanda, Atsushi, 4,191,866, Cl. 200-4.000.
Ikeda, Masashi; and Kihara, Kazuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for manufacturing a semiconductor device. 4,190,949, Cl. 29-571.000.
Ikeda, Tadashi: *See—*
Fuseya, Yoshiharu; Inoue, Atsuo; Hara, Hiroshi; and Ikeda, Tadashi, 4,191,576, Cl. 430-512.00V.
Illers, Karl H.; and Stutz, Herbert, to BASF Wyandotte Corporation. Process for preparing heat-resistant polyurethane elastomers having no secondary softening range. 4,191,818, Cl. 528-44.000.
Illinois Tool Works Inc.: *See—*
Allison, C. Jay, Jr.; and Willis, Kirk, 4,191,116, Cl. 111-4.000.
Suffern, Bruce C., 4,191,290, Cl. 206-150.000.
Imada, Isuke: *See—*
Yamamura, Yuichi; Azuma, Ichiro; Sugimura, Kazuhisa; Morimoto, Hiroshi; Imada, Isuke; and Watanabe, Masazumi, 4,191,778, Cl. 424-317.000.
Imai, Chikara: *See—*
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Imamura, Hiroyuki: *See—*
Endo, Takaya; Sato, Shui; Kikuchi, Shoji; Kozima, Tamotsu; Usui, Tugumoto; Imamura, Hiroyuki; and Takabe, Koichi, 4,191,574, Cl. 430-387.000.
Imatt, Alex: *See—*
Meyer, Burton C.; Kulesza, Ralph J.; and Imatt, Alex, 4,191,370, Cl. 272-120.000.
Imperial Chemical Industries Limited: *See—*
Austin, Peter W., 4,191,687, Cl. 260-153.000.
Baker, Brian, 4,191,616, Cl. 203-44.000.
Glen, Alasdair T., 4,191,775, Cl. 424-304.000.
Parker, David G.; and Tompsett, Alan J., 4,191,709, Cl. 260-583.00R.
Smith, Clive P., 4,191,678, Cl. 260-40.00R.
IMS Limited: *See—*
Ogle, Robert W., 4,191,225, Cl. 141-329.000.
Inaba, Shizuo, to Pioneer Electronic Corporation. Turntable rotation control device. 4,191,382, Cl. 274-15.00R.
Inagaki, Yutaka; Matsubara, Hironaga; and Ishise, Kojiro, to Sumitomo Electric Industries, Ltd. Fire spreading inhibitor composition. 4,191,675, Cl. 260-29.300.
Inasawa, Hideho; and Akiyama, Yoshinori, to Nissan Motor Company, Limited. Adjustable headrest. 4,191,422, Cl. 297-391.000.
Ingerson, Quentin F.: *See—*
Edens, Walter W.; and Ingerson, Quentin F., 4,191,601, Cl. 148-160.000.
Inoue, Atsuo: *See—*
Fuseya, Yoshiharu; Inoue, Atsuo; Hara, Hiroshi; and Ikeda, Tadashi, 4,191,576, Cl. 430-512.00V.
Inoue, Tadashi: *See—*
Kada, Tsuneo; Inoue, Tadashi; and Morita, Kazuyoshi, 4,191,752, Cl. 424-177.000.
Inoue, Takao: *See—*
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Inoue, Wahei, to Kabushiki Kaisah Maekawa Seisakusho. Apparatus for cooling brine. 4,191,027, Cl. 62-185.000.
Institut Francais du Petrole: *See—*
Cosyns, Jean; Marcilly, Christian; Miquel, Jean; and Le Page, Jean-Francois, 4,191,632, Cl. 585-483.000.
Institut Textile de France: *See—*
Lehmann, Robert; Lyonnet, Andre; and Rochas, Paul, 4,191,010, Cl. 57-208.000.

Institute of Gas Technology: *See*—
Patel, Jitendra G.; Schora, Frank C.; and Loeding, John W., 4,191,539, Cl. 48-210.000.
Instituto Franco Tosi S.p.A.: *See*—
Tosi, Carlo, 4,191,780, Cl. 424-324.000.
Instituto Venezolano de Investigaciones Cientificas (IVIC): *See*—
Schmidt, Pierre E.; and Das, Mukunda B., 4,191,963, Cl. 357-23.000.
Instruments S.A.: *See*—
Passereau, Genevieve, 4,191,474, Cl. 356-305.000.
International Business Machines Corporation: *See*—
Brock, George W.; Pawlowski, Edward J.; and Stone, Ricardo R., 4,192,003, Cl. 364-487.000.
Garbarino, Paul L.; Revitz, Martin; and Shepard, Joseph F., 4,191,603, Cl. 148-187.000.
Gow, John, 3rd; Hoffman, Herman S.; and Stephans, Earl, 4,191,938, Cl. 338-195.000.
King, Francis K.; Maurine, Ronald J.; and Wanek, Donald J., 4,191,980, Cl. 360-99.000.
Lewkowicz, Julian, 4,191,977, Cl. 360-66.000.
Luiz, Fernando A., 4,191,997, Cl. 364-200.000.
Tomczak, James J.; and Wilson, Richard N., 4,191,899, Cl. 307-303.000.
Van Winkle, Howard E., 4,191,981, Cl. 360-99.000.
International Flavors & Fragrances Inc.: *See*—
Schreiber, William L.; Siano, James N.; Vock, Manfred H.; and Shuster, Edward J., 4,191,660, Cl. 252-174.110.
Withycombe, Donald A.; Mookherjee, Braja D.; Vock, Manfred H.; and Vinals, Joaquin F., 4,191,785, Cl. 426-536.000.
International Harvester Company: *See*—
Kerber, Dathan R.; Johnson, Orlin W.; and Week, Robert D., 4,191,006, Cl. 56-11.600.
International Nickel Company, Inc., The: *See*—
Hurley, John L.; Luch, Daniel; and Knipple, Charles J., 4,191,617, Cl. 204-40.000.
International Paint Company Limited, The: *See*—
Hails, George; and Symonds, John D., 4,191,579, Cl. 106-15.00R.
International Paper Company: *See*—
Nehring, John R., 4,191,204, Cl. 137-205.000.
International Telephone and Telegraph Corporation: *See*—
Borsuk, Leslie M., 4,191,447, Cl. 350-96.200.
Inventio AG: *See*—
Meyer, Fritz; Heine, Josef; and Vig, Ladislav, 4,191,277, Cl. 187-29.00R.
Ionics, Incorported: *See*—
Hodgdon, Russell B., 4,191,811, Cl. 521-27.000.
Irvine, John L., to Conoco, Inc. Increasing alumina slurry life. 4,191,737, Cl. 423-630.000.
Isaacs, Roger H.; Sandelman, David; and Shprecher, Daniel E., to Rapidcircuit Corp. Integral thermostat-digital clock unit. 4,191,328, Cl. 236-46.00R.
Ishida, Yasuhiko: *See*—
Katahira, Eturou; Yamaguchi, Shunzo; Kida, Masashi; Ishida, Yasuhiko; and Miyagi, Hideo, 4,191,013, Cl. 60-276.000.
Ishidoshiro, Hiroshi: *See*—
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Ishikawa, Shigewo: *See*—
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Ishise, Kojiro: *See*—
Inagaki, Yutaka; Matsubara, Hironaga; and Ishise, Kojiro, 4,191,675, Cl. 260-29.300.
Isleif, Karl-Heinz: *See*—
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Isovolta, Osterreichische Isolierstoffwerke Aktiengesellschaft: *See*—
Wehrmann, Felix; Voelkl, Rene-Hagen; and Wojta, Edwin, 4,191,667, Cl. 260-2.300.
ITI Limited: *See*—
Mougin, Georges L., 4,191,491, Cl. 405-52.000.
Ito, Fumio: *See*—
Kawamura, Masaharu; Sakurada, Nobuaki; Shinoda, Nobuhiko; Ito, Fumio; Murakami, Hiroyashu; and Ito, Tadashi, 4,191,458, Cl. 354-23.00D.
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Ito, Susumu: *See*—
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Ito, Tadashi: *See*—
Kawamura, Masaharu; Sakurada, Nobuaki; Shinoda, Nobuhiko; Ito, Fumio; Murakami, Hiroyashu; and Ito, Tadashi, 4,191,458, Cl. 354-23.00D.
ITT Industries, Incorporated: *See*—
Belart, Juan; and Kircher, Dieter, 4,191,210, Cl. 137-505.130.
Iwasaki, Masayuki: *See*—
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Iwata, Shuzi: *See*—
Ono, Fumitaka; Semasa, Takayoshi; Ueno, Yutaka; and Iwata, Shuzi, 4,191,974, Cl. 358-261.000.
J. M. Huber Corporation: *See*—
Wason, Satish K.; and Mays, Robert K., 4,191,742, Cl. 424-49.000.
J. M. Voith GmbH: *See*—
Schiel, Christian, 4,190,964, Cl. 34-114.000.
Jack, James; and King, Godfrey A., to Bakelite Xylonite Limited. Process for producing multicellular articles from a blend of a crystalline polyolefin and a metal resinate. 4,191,719, Cl. 264-41.000.
Jacobi, Edgar F.; and Madden, Mark R., to Colkhi, Inc. Irrigation pipe control system. 4,191,207, Cl. 137-344.000.
Jacobson, Alexander D.: *See*—
Braatz, Paul O.; Grinberg, Jan; Jacobson, Alexander D.; and Waldner, Michael, 4,191,454, Cl. 350-342.000.
Grinberg, Jan; Braatz, Paul O.; Waldner, Michael; and Jacobson, Alexander D., 4,191,452, Cl. 350-342.000.
Jacoby, Marvin; Jacoby, Richard; and Ellson, Robert, to Air Test Labs, Inc. Atmospheric sampling apparatus. 4,191,054, Cl. 73-421.50R.
Jacoby, Richard: *See*—
Jacoby, Marvin; Jacoby, Richard; and Ellson, Robert, 4,191,054, Cl. 73-421.50R.
Jagst, Peter, to Trutzschler GmbH & Co. KG. Apparatus for breaking textile fiber bales. 4,190,933, Cl. 19-81.000.
Jahnke, Richard W., to Lubrizol Corporation, The. Hot melt metal working lubricants and methods for their application. 4,191,658, Cl. 252-32.70E.
Jahnke, Richard W., to Lubrizol Corporation, The. Hot melt metal working lubricants. 4,191,801, Cl. 428-467.000.
James D. Pauls and J. Claybrook Lewis and Associates, Limited: *See*—
Blake, William S.; and Hammett, Roy, 4,191,313, Cl. 222-335.000.
James, Reginald S.; Grier, Thomas M.; and Schmidt, Robert D., to General Electric Company. Method and apparatus for aligning turbine internal components. 4,190,961, Cl. 33-180.00R.
Janome Sewing Machine Co. Ltd.: *See*—
Eguchi, Yasukata; and Makabe, Hachiro, 4,191,121, Cl. 112-158.00B.
Janos, Wilbert J.: *See*—
Harris, Richard M.; and Janos, Wilbert J., 4,191,922, Cl. 324-225.000.
Janotik, Adam M.: *See*—
Stickels, Charles A.; and Janotik, Adam M., 4,191,599, Cl. 148-16.500.
Janssen, Robert I., to Padco, Inc. Paint roller. 4,191,792, Cl. 427-260.000.
Jardin, Hans; Hirschberger, August; and Isleif, Karl-Heinz, to Webasto-Werk W. Baier GmbH and Co. Drive arrangement for sliding roofs, window panes and other similar members in motor vehicles. 4,191,068, Cl. 74-625.000.
Jarman, Alonzo B.: *See*—
Zeuner, Kenneth W.; and Jarman, Alonzo B., 4,191,091, Cl. 91-52.000.
Jaulmes, Eric, to Ateliers de la Motobecane, S.A. Two-cycle internal combustion engine. 4,191,138, Cl. 123-73.00R.
Jaunarajs, Karlis L., to Johns-Manville Corporation. Alkali resistant glass article and method of preparation. 4,191,585, Cl. 106-99.000.
Jautelat, Manfred: *See*—
Arlt, Dieter; and Jautelat, Manfred, 4,191,712, Cl. 260-654.00D.
Jeanneret, Remy; Zwahlen, Gunther; Frey, Christoph; and Zographos, Georgios, to Ciba-Geigy Corporation. Electrophotographic imaging process using anthraquinoid black pigments or metal complexes. 4,191,566, Cl. 430-31.000.
Jelinek, Jerry G., to Parker-Hannifin Corporation. Sealing washer. 4,191,389, Cl. 277-166.000.
Jenkins, Charles W., to Container Corporation of America. Method and apparatus for gas sample analysis. 4,191,541, Cl. 55-18.000.
Jenkins, William A.: *See*—
Bussard, Charles B.; and Jenkins, William A., 4,191,608, Cl. 156-584.000.
Jensen, Hans P., to Julius Koch USA Inc. Lockbar for fence post mounting. 4,191,361, Cl. 256-12.500.
Johannessen, Paul R., to Megapulse Incorporated. Method of and apparatus for enabling soft-failure of modular power converter systems, including RF generator systems, embodying switching components in the power conversion. 4,191,992, Cl. 363-50.000.
Johansson, Tryggve J. Door operating apparatus. 4,191,915, Cl. 318-464.000.
John C. Lehman, Inc.: *See*—
Lehman, John C., 4,191,435, Cl. 312-266.000.
John J. Sundheim Family Estate, The: *See*—
Halls, Kenneth F.; and Gibbons, Robert R., 4,191,589, Cl. 134-21.000.
Sundheim, John J., 4,191,590, Cl. 134-21.000.
John Wyeth & Brother Ltd.: *See*—
Crossley, Roger, 4,191,761, Cl. 424-245.000.
Johns-Manville Corporation: *See*—
Jaunarajs, Karlis L., 4,191,585, Cl. 106-99.000.
Johnson, Bruce K., to Polaroid Corporation. Fixed focus exposure control apparatus with reverse spherical aberration corrective characteristic. 4,191,462, Cl. 354-139.000.
Johnson, Claude D., to Akzona Incorporated. Freeze indicator. 4,191,125, Cl. 116-219.000.
Johnson, George C.: *See*—
Audeh, Costandi A.; and Johnson, George C., 4,191,639, Cl. 208-309.000.
Johnson & Johnson: *See*—
Lemieux, Francis P., 4,191,185, Cl. 128-214.400.
Johnson, Michael E.: *See*—
Watson, James M.; and Johnson, Michael E., 4,191,614, Cl. 202-177.000.
Johnson, Orlin W.: *See*—
Kerber, Dathan R.; Johnson, Orlin W.; and Week, Robert D., 4,191,006, Cl. 56-11.600.

Johnson, Paul H.: *See*—
Uraneck, Carl A.; and Johnson, Paul H., 4,191,732, Cl. 423-243.000.
Johnson, Roy A., to Upjohn Company, The. Enlarged-hetero-ring prostacyclin analogs. 4,191,691, Cl. 260-345.200.
Johnson, Roy A.; and Sih, John C., to Upjohn Company, The. 5-Hydroxy-PGI$_1$ compounds. 4,191,822, Cl. 542-416.000.
Johnston, David B. R.; and Arth, Glen E., deceased (by Arth, Rose B.), to Merck & Co., Inc. N-substituted-17β-carbamoylandrost-4-en-3-one 5α reductase inhibitors. 4,191,759, Cl. 424-242.000.
Johnstun, Dick E. Marker manifold. 4,191,405, Cl. 282-28.00A.
Jolly, Richard D.: *See*—
Croy, David G.; Rafferty, Andrew J.; and Jolly, Richard D., 4,191,256, Cl. 166-343.000.
Jones, Jeffery C. Tie down anchor. 4,191,108, Cl. 410-110.000.
Jones, John E., to General Motors Corporation. Power mode air switching diverter valve. 4,191,014, Cl. 60-290.000.
Jones, John E.: *See*—
Brown, Wayne R.; Jones, John E.; and Sherrill, Charles F., 4,191,917, Cl. 320-2.000.
Jones, Marvin H.: *See*—
Houk, Richard D.; and Jones, Marvin H., 4,191,064, Cl. 74-475.000.
Josefson, Arnold J.; and Munson, Loren R., to DeSoto, Inc. Electrodeposition of high molecular weight copolymers. 4,191,624, Cl. 204-181.00T.
Joseph L. Herman Family Trust, The: *See*—
Herman, Joseph L., 4,191,127, Cl. 118-57.000.
Joslyn Mfg. and Supply Co.: *See*—
Cunningham, Francis V., 4,191,908, Cl. 313-325.000.
Jouquey, Alain; Raynaud, Jean-Pierre; and Salmon, Jean, to Roussel Uclaf. Novel steroids. 4,191,697, Cl. 260-397.500.
Jourquin, Lucien; and Du Prez, Eddie, to s.a. PRB. Hydrophile polyurethane foam, process for preparing said foam and hydrophile product based on said foam. 4,191,815, Cl. 521-51.000.
Julius Koch USA Inc.: *See*—
Jensen, Hans P., 4,191,361, Cl. 256-12.500.
Jusinskas, Julius, Jr.: *See*—
McLaughlin, Donald W., 4,191,857, Cl. 179-15.0BY.
Jutila, Raymond E.: *See*—
Wood, William P.; and Jutila, Raymond E., 4,191,982, Cl. 360-123.000.
K and Manufacturing Company, Inc.: *See*—
Fermi, Rudy; Pickard, John; Kocsis, Alex; Bratton, David; and Kasner, Gerald, 4,191,106, Cl. 101-415.100.
Kabushiki Kaisah Maekawa Seisakusho: *See*—
Inoue, Wahei, 4,191,027, Cl. 62-185.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Komatsu, Mitsuaki; and Yokoyama, Akinori, 4,191,015, Cl. 60-361.000.
Kabushiki Kaisha Seikosha: *See*—
Oishi, Masaaki; Ashida, Itaru; and Suzuki, Tetsuro, 4,191,067, Cl. 74-577.00M.
Kabushiki Kaisha Suwa Seikosha: *See*—
Kogure, Shigeru, 4,191,906, Cl. 310-370.000.
Kada, Tsuneo; Inoue, Tadashi; and Morita, Kazuyoshi, to Kanebo, Ltd. Isolation of anti-mutagenic factor from cabbage juice. 4,191,752, Cl. 424-177.000.
Kadatz, Rudolf: *See*—
Nickl, Josef; Muller, Erich; Narr, Berthold; Haarmann, Walter; Schroter, Wolfgang; and Kadatz, Rudolf, 4,191,776, Cl. 424-308.000.
Kadono, Mamoru; Saigusa, Tetsuji; Nakajima, Yoshiyuki; and Koga, Tomohiro, to Bridgestone Tire Company, Limited. Reinforcing rubber hose. 4,191,217, Cl. 138-109.000.
Kahn, William M. Teletypewriter motor controlling. 4,191,848, Cl. 178-4.10R.
Kalfoglou, George, to Texaco Inc. Surfactant waterflood oil recovery method. 4,191,253, Cl. 166-275.000.
Kali-Chemie Pharma GmbH: *See*—
Liepmann, Hans; Hueschens, Rolf; Milkowski, Wolfgang; Zeugner, Horst; Heinemann, Henning; Wolf, Klaus-Ullrich; Hell, Insa; and Hempel, Reinhard, 4,191,770, Cl. 424-266.000.
Kamiya, Takashi; Teraji, Tsutomu; Hashimoto, Masashi; Nakaguti, Osamu; and Oku, Teruo, to Fujisawa Pharmaceutical Co., Ltd. 2-Lower alkyl-7-substituted amino-2 or 3-cephem-4-carboxylic acid compounds. 4,191,762, Cl. 424-246.000.
Kanaya, Tadashi: *See*—
Sato, Katsutoshi; Ito, Susumu; Kanaya, Tadashi; Onishi, Hiroaki; Ichiishi, Tsuneo; and Osaka, Akira, 4,191,286, Cl. 193-40.000.
Kanda, Atsushi: *See*—
Nakajima, Kunihiko; Sato, Kyoshi; Iio, Toshimitsu; and Kanda, Atsushi, 4,191,866, Cl. 200-4.000.
Kanebo, Ltd.: *See*—
Kada, Tsuneo; Inoue, Tadashi; and Morita, Kazuyoshi, 4,191,752, Cl. 424-177.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Yonezawa, Kazuya; Kato, Yasushi; Furkawa, Hisao; and Azuma, Masaaki, 4,191,713, Cl. 525-102.000.
Yonezawa, Kazuya; Kato, Yasushi; Furukawa, Hisao; and Azuma, Masaaki, 4,191,714, Cl. 525-102.000.
Kaneyasu, Masataka: *See*—
Miura, Yoshiaki; Kaneyasu, Masataka; and Okamoto, Akira, 4,191,731, Cl. 423-242.000.
Kant, Rajni, to Fairchild Camera & Instrument Corp. Headless resistor. 4,191,964, Cl. 357-51.000.
Kaplan, Donald H.: *See*—
Springer, Joseph F.; and Kaplan, Donald H., 4,191,941, Cl. 340-166.00R.
Kaplan, Stephen J.; and Lengyel, Ladislaus S. Filtration device for filtering temperature controlled fluids. 4,191,648, Cl. 210-186.000.
Karasudani, Yasuo, to Tokico Ltd. Slidable support structure for a disc brake caliper. 4,191,278, Cl. 188-73.300.
Karpal, David L., to Teledyne Industries, Inc. Aircraft battery. 4,191,807, Cl. 429-176.000.
Kashio, Toshio, to Casio Computer Co., Ltd. System of displaying to a customer an amount of paper money delivered as a change. 4,191,999, Cl. 364-405.000.
Kask, Eugene, to Rogers Corporation. Liquid level indicating floats. 4,191,050, Cl. 73-322.500.
Kasner, Gerald: *See*—
Fermi, Rudy; Pickard, John; Kocsis, Alex; Bratton, David; and Kasner, Gerald, 4,191,106, Cl. 101-415.100.
Kassai Kabushikikaisha: *See*—
Kassai, Kenzo, 4,191,397, Cl. 280-647.000.
Kassai, Kenzo, to Kassai Kabushikikaisha. Baby carriage. 4,191,397, Cl. 280-647.000.
Kasselmann, John T., to Bendix Corporation, The. Trailer hitch. 4,191,394, Cl. 280-432.000.
Katahira, Eturou; Yamaguchi, Shunzo; Kida, Masashi; Ishida, Yasuhiko; and Miyagi, Hideo, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Device for purifying exhaust gases from internal combustion engine. 4,191,013, Cl. 60-276.000.
Kataoka, Nobuyuki; Takahashi, Takuya; Ohkawa, Fujio; and Anzai, Shiro, to Bridgestone Tire Company, Limited. Abrasion resistant rubber compositions. 4,191,671, Cl. 260-23.70M.
Kato, Fumio: *See*—
Kuroda, Michio; Yamazaki, Yoshiaki; Namura, Kiyoshi; Kato, Fumio; Akatsu, Yasuaki; Morimoto, Daizo; and Ninomiya, Satoshi, 4,191,508, Cl. 416-196.00R.
Kato, Yasushi: *See*—
Yonezawa, Kazuya; Kato, Yasushi; Furkawa, Hisao; and Azuma, Masaaki, 4,191,713, Cl. 525-102.000.
Yonezawa, Kazuya; Kato, Yasushi; Furukawa, Hisao; and Azuma, Masaaki, 4,191,714, Cl. 525-102.000.
Katoh, Kazunobu: *See*—
Okita, Tsutomu; Satou, Masami; Hibino, Noburo; Katoh, Kazunobu; and Sugiyama, Masatoshi, 4,191,679, Cl. 260-40.00R.
Katoh, Tetsuya, to Hitachi Chemical Company, Ltd. Expandable particles of a styrene polymer having small particle size. 4,191,803, Cl. 428-407.000.
Katterheinrich, Fred H.; and Small, James R., to Hobart Corporation. Package labeling system and methd for applying a label to a package. 4,191,605, Cl. 156-285.000.
Katz, David H., to Scripps Clinic and Research Foundation. Induction of immunological tolerance. 4,191,668, Cl. 260-6.000.
Katzer, Hans: *See*—
Kratel, Gunter; Stohr, Gunter; and Katzer, Hans, 4,191,587, Cl. 106-308.00Q.
Kaufman, Ernest D.: *See*—
Begala, Arthur J., Jr.; and Kaufman, Ernest D., 4,191,645, Cl. 210-47.000.
Kaufman, John W., to United States of America, National Aeronautics and Space Administration. Wind wheel electric power generator. 4,191,505, Cl. 415-2.000.
Kawai Musical Instrument Mfg. Co., Ltd.: *See*—
Deutsch, Ralph; and Deutsch, Leslie J., 4,191,081, Cl. 84-1.030.
Kawai, Takeo: *See*—
Kuramoto, Akio; and Kawai, Takeo, 4,191,272, Cl. 180-84.000.
Kawakami, Yoshihisa: *See*—
Miki, Toshio; Fujita, Yoshiki; and Kawakami, Yoshihisa, 4,191,432, Cl. 308-187.000.
Kawamura, Masaharu; Sakurada, Nobuaki; Shinoda, Nobuhiko; Ito, Fumio; Murakami, Hiroyashu; and Ito, Tadashi, to Canon Kabushiki Kaisha. Photographic information settiong display circuit. 4,191,458, Cl. 354-23.00D.
Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Komatsu, Tadaomi, 4,191,502, Cl. 414-140.000.
Kawashima, Kazumi: *See*—
Takeshita, Masahiro; Kawashima, Kazumi; Ueda, Minoru; and Yamamoto, Keisuke, 4,191,924, Cl. 325-465.000.
Kawata, Shoji; and Sakakibara, Naoji, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Engine idling speed control signal generator. 4,191,051, Cl. 73-347.000.
Kaye, Dianne, to Tripoint, Inc. Triaxial fabric pattern. 4,191,219, Cl. 139-383.00R.
Kazumasa, Suzuki: *See*—
Yoshikazu, Nakajima; Kazumasa, Suzuki; and Tsuyoshi, Makino, 4,191,810, Cl. 435-177.000.
Kearney & Trecker Corporation: *See*—
Kielma, Ervin J., 4,190,948, Cl. 29-568.000.
Keats, Albert B.; and Leggett, Dudley W., to United Kingdom Atomic Energy Authority. Safety circuits for coupling laddics in cascade. 4,192,013, Cl. 365-91.000.
Keeler, Robert J., to Abbott Laboratories. Removable digit engageable means for separating a catheter and stylet. 4,191,186, Cl. 128-214.400.
Keeling, K. Bailey, Jr.: *See*—
Powell, John M.; and Keeling, K. Bailey, Jr., 4,191,434, Cl. 312-214.000.
Keenberg, Larry E.: *See*—
Schara, Robert E.; Keenberg, Larry E.; and Makar, Andrew, 4,191,781, Cl. 426-2.000.

Keeny, Harry F., III, to Warner Electric Brake & Clutch Company. Helical spring coupling with programmable control collar. 4,191,283, Cl. 192-26.000.

Keith, Roger H., to Minnesota Mining and Manufacturing Company. Pivotably interlocking rigid heat-resistant tiles. 4,190,998, Cl. 52-591.000.

Keller, Dennis H. Tennis trainer device. 4,191,372, Cl. 273-29.00A.

Keller, Ervin J. Vehicle tire sun shield and method of installing same. 4,190,939, Cl. 29-451.000.

Keller, George E., II: *See*—
Moyer, Charles E., Jr.; Keller, George E., II; Beisner, Robert W.; and Walker, Wellington E., 4,191,701, Cl. 260-450.000.

Kelly, Donald A. Dual conversion steam and electric solar power system. 4,191,164, Cl. 126-439.000.

Keranen, John J., to Eaton Corporation. Pushbutton locking attachment with tolerance compensating latch. 4,191,066, Cl. 74-527.000.

Kerber, Dathan R.; Johnson, Orlin W.; and Week, Robert D., to International Harvester Company. Floating cutterbar knife drive. 4,191,006, Cl. 56-11.600.

Kerchner, Charles F., Jr. Heating apparatus and controls therefor. 4,191,879, Cl. 219-358.000.

Kerner, William R.; and Morton, Jarred. Data reduction system. 4,192,010, Cl. 364-900.000.

Kernforschungsanlage Julich Gesellschaft mit beschrankter: *See*—
Struck, Bernd D., 4,191,619, Cl. 204-104.000.

Kerr, John L., to United States of America, Army. Microstrip antenna with circular polarization. 4,191,959, Cl. 343-700.0MS.

Keske, Frank E., to Caterpillar Tractor Co. Modular heat exchanger with resilient mounting and sealing element. 4,191,244, Cl. 165-69.000.

Kessler & Luch GmbH: *See*—
Gersch, Dietfried, 4,191,098, Cl. 98-40.00N.

Kesten, Martin: *See*—
Edwards, Richard L.; and Kesten, Martin, 4,191,077, Cl. 83-99.000.

Keyworth, Donald A.; and Sudduth, Jerome R., to Tenneco Chemicals, Inc. Method of cleaning fouled heat exchangers and other equipment. 4,191,588, Cl. 134-2.000.

Kida, Masashi: *See*—
Katahira, Eturou; Yamaguchi, Shunzo; Kida, Masashi; Ishida, Yasuhiko; and Miyagi, Hideo, 4,191,013, Cl. 60-276.000.

Kiefer, Gunther, to Adolf Illig Maschinenbau GmbH & Co. Sealing arrangement for a molding apparatus. 4,191,520, Cl. 425-387.100.

Kielma, Ervin J., to Kearney & Trecker Corporation. Vertical spindle machine tool with tiltable spindle and tiltable automatic tool changer. 4,190,948, Cl. 29-568.000.

Kihara, Kazuo: *See*—
Ikeda, Masashi; and Kihara, Kazuo, 4,190,949, Cl. 29-571.000.

Kikuchi, Shoji: *See*—
Endo, Takaya; Sato, Shui; Kikuchi, Shoji; Kozima, Tamotsu; Usui, Tugumoto; Imamura, Hiroyuki; and Takabe, Koichi, 4,191,574, Cl. 430-387.000.

Kikuya, Satoshi: *See*—
Furumoto, Mitsunobu; Yano, Osahiko; Kikuya, Satoshi; Kubo, Kanji; and Sakumoto, Hideki, 4,191,978, Cl. 360-75.000.

Kimball International, Inc.: *See*—
Wilcox, Brian N.; Schroeder, Melvin J.; Whittington, Billy J.; and Robinson, John W., 4,191,083, Cl. 84-1.280.

King, Francis K.; Maurine, Ronald J.; and Wanek, Donald J., to International Business Machines Corporation. Transducers with tapered edge profiles and assembly thereof. 4,191,980, Cl. 360-99.000.

King, Gerald D. Clutch with fluid actuator. 4,191,284, Cl. 192-85.0AA.

King, Godfrey A.: *See*—
Jack, James; and King, Godfrey A., 4,191,719, Cl. 264-41.000.

King, Henry L.: *See*—
Rushing, John C.; Smith, William E.; and King, Henry L., 4,191,611, Cl. 162-273.000.

King, John A.; and O'Brien, Douglas W., to Essex Group, Inc. Loudspeaker padring and method of making the same. 4,191,865, Cl. 179-178.000.

Kinghorn, Mark D., Jr.: *See*—
Kinghorn, Mark D., Sr.; and Kinghorn, Mark D., Jr., 4,191,303, Cl. 220-222.000.

Kinghorn, Mark D., Sr.; and Kinghorn, Mark D., Jr. Liquid storage tank sealing system. 4,191,303, Cl. 220-222.000.

Kingler, Karl H.; Thiemer, Klause; and Stroman, Fritz, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Maleic acid halfamides having blood pressure raising activity. 4,191,777, Cl. 424-316.000.

Kinney, Alfred W., to Phillips Petroleum Company. Pleated closure construction. 4,191,322, Cl. 229-5.800.

Kinsella, Florence A. Neck protector. 4,190,903, Cl. 2-60.000.

Kircher, Dieter: *See*—
Belart, Juan; and Kircher, Dieter, 4,191,210, Cl. 137-505.130.

Kirchoff, Francis D., to Alco Electronic Products, Inc. Watertight seal for toggle switches. 4,191,387, Cl. 277-30.000.

Kirk, Donald, Jr., to Digital Communications, Inc. Video signal communications system with improved signal-to-noise ratio. 4,191,968, Cl. 358-141.000.

Kirkman, Richard T.: *See*—
Fortner, John M.; and Kirkman, Richard T., 4,191,548, Cl. 65-79.000.

Kirkpatrick, Michael F. Hinge mechanism for folding chairs. 4,191,419, Cl. 297-48.000.

Kirner, Hans D.: *See*—
Wegmann, Jacques; and Kirner, Hans D., 4,191,680, Cl. 260-42.000.

Kishigami, Jun: *See*—
Matsuda, Atsushi; and Kishigami, Jun, 4,191,863, Cl. 179-115.50R.

Kishimoto, Kiyomi: *See*—
Okabe, Hiromichi; Kishimoto, Kiyomi; and Ohi, Fumio, 4,191,708, Cl. 260-582.000.

Kitagawa, Yoshiko. Collapsible box. 4,191,324, Cl. 229-22.000.

Kitai, Kiyoshi: *See*—
Saito, Takeo; Seki, Youichi; and Kitai, Kiyoshi, 4,191,459, Cl. 354-23.00D.

Kivits, Hendrikus P. M.: *See*—
Tels, Martinus; Lotens, Jan P.; and Kivits, Hendrikus P. M., 4,191,728, Cl. 423-24.000.

Kizaki, Sigeru: *See*—
Yasuda, Yuh; Kizaki, Sigeru; and Miya, Yukio, 4,191,905, Cl. 310-344.000.

Klatt, William M.: *See*—
Bradley, William E.; Timm, Gerald W.; Klatt, William M.; and Graves, Wayne H., 4,191,196, Cl. 128-733.000.

Klemm, Klaus; and Wahlig, Helmut, to Merck Patent Gesellschaft mit beschrankter Haftung. Antibacterial wound dressing. 4,191,743, Cl. 424-28.000.

Kliegman, Jonathan M., to GAF Corporation. Monaza amides and amines as ethylene inhibitors. 4,191,555, Cl. 71-95.000.

Klindworth, Duane O. Folding wide pass draft implement. 4,191,260, Cl. 172-311.000.

Kling, William E. Fireplace heater. 4,191,161, Cl. 126-121.000.

Klockner-Humboldt-Deutz: *See*—
Bender, Hans; Schnabel, Georg; Duren, Gottfried; and Zabel, Wolf, 4,191,591, Cl. 134-25.00R.

Klug, Frederic J.: *See*—
Pasco, Wayne D.; and Klug, Frederic J., 4,191,720, Cl. 264-43.000.
Pasco, Wayne D.; Klug, Frederic J.; and Prochazka, Svante, 4,191,721, Cl. 264-43.000.

Kluge, Albert D.: *See*—
Cina, Ronald A.; and Kluge, Albert D., 4,191,239, Cl. 164-200.000.

Klukos, Edward O. Shelf construction. 4,191,110, Cl. 108-27.000.

Kneer, Franz X., to Gebruder Weiss K.G. Method for the mechanical preparation of organic wastes in a biological digestion process. 4,191,643, Cl. 210-4.000.

Knipping (Proprietary) Limited: *See*—
Venter, Daniel J. J., 4,191,227, Cl. 145-46.000.

Knipple, Charles J.: *See*—
Hurley, John L.; Luch, Daniel; and Knipple, Charles J., 4,191,617, Cl. 204-40.000.

Knorr-Bremse GmbH: *See*—
Schirmer, Klaus, 4,191,430, Cl. 303-109.000.

Knorr, Harald: *See*—
Wiezer, Hartmut; Pfahler, Gerhard; Mayer, Norbert; and Knorr, Harald, 4,191,684, Cl. 260-48.5NT.

Knox, William A.; and Gonzalez, Raymond J. Warning apparatus with a line integrity supervisory circuit. 4,191,946, Cl. 340-506.000.

Kobashi, Kiyoshi: *See*—
Nohira, Hidetaka; Kobashi, Kiyoshi; and Nakano, Jiro, 4,191,144, Cl. 123-117.00R.

Kocsis, Alex: *See*—
Fermi, Rudy; Pickard, John; Kocsis, Alex; Bratton, David; and Kasner, Gerald, 4,191,106, Cl. 101-415.100.

Kodama, Hisashi, to Aisin Seiki Kabushiki Kaisha. Self-contained hydraulic lash adjuster. 4,191,142, Cl. 123-90.580.

Koehler, Gerard; Aguettaz, Jean; Berthelot, Alain; Genter, Claude; and Arnoux, Daniel, to Manufacture Francaise d'Appareils Electriques de Mesure. Electromagnet magnetic circuit with permanent-magnet armature. 4,191,937, Cl. 335-230.000.

Koga, Tomohiro: *See*—
Kadono, Mamoru; Saigusa, Tetsuji; Nakajima, Yoshiyuki; and Koga, Tomohiro, 4,191,217, Cl. 138-109.000.

Kogure, Shigeru, to Kabushiki Kaisha Suwa Seikosha. Tuning fork type quartz crystal resonator with notched tines. 4,191,906, Cl. 310-370.000.

Kohashi, Takahiro: *See*—
Nonogaki, Saburo; Kohashi, Takahiro; and Hatano, Yoshio, 4,191,571, Cl. 430-335.000.

Koike, Masahiko, to Nippon Gakki Seizo Kabushiki Kaisha. Key range dividing type electronic musical instrument. 4,191,082, Cl. 84-1.190.

Koivusalo, Mauno K. Door-closer and hinge combination. 4,190,925, Cl. 16-54.000.

Kojimoto, Susumu; Sato, Takami; and Mori, Toshio, to Sumitomo Chemical Company, Limited. Equipment for producing special pipes. 4,191,518, Cl. 425-326.100.

Komachi, Yushi: *See*—
Miyoshi, Tsutomu; Yanagita, Shuichi; and Komachi, Yushi, 4,191,268, Cl. 177-210.00C.

Komatsu, Mitsuaki; and Yokoyama, Akinori, to Kabushiki Kaisha Komatsu Seisakusho. Universal toroidal circuit for hydraulic torque converters. 4,191,015, Cl. 60-361.000.

Komatsu, Tadaomi, to Kawasaki Jukogyo Kabushiki Kaisha. Cargo-handling machine with 300-degree operational azimuth range for shipboard use. 4,191,502, Cl. 414-140.000.

Kommanditbolaget United Stirling (Sweden) AB & Co.: *See*—
Bratt, Jan C.; Moodysson, Bengt-Ove M.; and Rosenqvist, Nils K. G., 4,191,019, Cl. 60-525.000.

Kompis, Ivan; and Wick, Alexander E., to Hoffmann-La Roche Inc. Benzylpyrimidines. 4,191,758, Cl. 424-229.000.

Kondis, Thomas J., to Aluminum Company of America. Production of metallic powders. 4,191,557, Cl. 75-0.50A.

Konig, Klaus: *See*—
Lindner, Christian; Suling, Carlhans; Bartl, Herbert; Schreckenberg, Manfred; Freitag, Dieter; and Konig, Klaus, 4,191,705, Cl. 260-463.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Endo, Takaya; Sato, Shui; Kikuchi, Shoji; Kozima, Tamotsu; Usui, Tugumoto; Imamura, Hiroyuki; and Takabe, Koichi, 4,191,574, Cl. 430-387.000.
Kopjew, Iwan: *See*—
Krumphold, Ralf; Paul, Heinrich; Busalow, Juri; and Kopjew, Iwan, 4,191,597, Cl. 148-12.00B.
Kopp, Arthur R., to AMP Incorporated. Self-clocking circuit. 4,191,897, Cl. 307-234.000.
Koppers Company, Inc.: *See*—
Calistrat, Michael M., 4,191,030, Cl. 64-13.000.
Kortusov, Leonid I.: *See*—
Grigorenko, Anatoly S.; Moroz, Jury A.; Kortusov, Leonid I.; Bocharov, Jury A.; and Safonov, Anatoly V., 4,191,044, Cl. 72-354.000.
Kovacs, Bela V.: *See*—
Smartt, Herschel B.; and Kovacs, Bela V., 4,191,563, Cl. 75-130.00R.
Kovacs, Gabor: *See*—
Szekely, Istvan; Kovacs, Gabor; Virag, Sandor; and Szentivanyi, Matyas, 4,191,774, Cl. 424-300.000.
Koyo Seiko Company Limited: *See*—
Miki, Toshio; Fujita, Yoshiki; and Kawakami, Yoshihisa, 4,191,432, Cl. 308-187.000.
Kozima, Tamotsu: *See*—
Endo, Takaya; Sato, Shui; Kikuchi, Shoji; Kozima, Tamotsu; Usui, Tugumoto; Imamura, Hiroyuki; and Takabe, Koichi, 4,191,574, Cl. 430-387.000.
Kratel, Gunter; Stohr, Gunter; and Katzer, Hans, to Wacker-Chemie GmbH. Preparation of hydrophobic silicon dioxide. 4,191,587, Cl. 106-308.00Q.
Kratz, Gerhard; and Kuehnel, Werner, to Siemens Aktiengesellschaft. Inverter comprising at least two controllable load thyristors. 4,191,993, Cl. 363-135.000.
Kratz, Gerhard; and Kuehnel, Werner, to Siemens Aktiengesellschaft. Inverter comprising at least two controllable load thyristors. 4,191,994, Cl. 363-135.000.
Krenn, Josef: *See*—
Haslinger, Leopold; and Krenn, Josef, 4,191,504, Cl. 415-1.000.
Kroesche, Henning: *See*—
Grafen, Paul; Kroesche, Henning; Schulz, Bernhard; Paust, Joachim; and Pfohl, Sigberg, 4,191,692, Cl. 260-345.500.
Krohn, Helimut; Kruse, Werner; and Resch, Reinhard, to Daimler-Benz Aktiengesellschaft. Servo brake system. 4,191,020, Cl. 60-550.000.
Krolak, Ronald L.; and Nelson, Delbert G., to Caterpillar Tractor Co. Main frame nose construction. 4,191,401, Cl. 280-796.000.
Kroyer, Karl K. K. Process of making a blistered, crystallizable glass material. 4,191,546, Cl. 65-20.000.
Krude, Werner: *See*—
Girguis, Sobhy L.; and Krude, Werner, 4,191,031, Cl. 64-21.000.
Kruke, Edward J.: *See*—
Reitz, Richard J.; and Kruke, Edward J., 4,191,429, Cl. 303-58.000.
Krumphold, Ralf; Paul, Heinrich; Busalow, Juri; and Kopjew, Iwan, to Akademie der Wissenschaften der DDR; and Akademie der Wissenschaften der UdSSR. Heat treatment for martensite cured alloys. 4,191,597, Cl. 148-12.00B.
Krupp-Koppers GmbH: *See*—
Schulze, Martin; and Preusser, Gerhard, 4,191,615, Cl. 203-3.000.
Kruse, Werner: *See*—
Krohn, Helimut; Kruse, Werner; and Resch, Reinhard, 4,191,020, Cl. 60-550.000.
Kubach, Hans: *See*—
Arnold, Winfried; and Kubach, Hans, 4,191,913, Cl. 318-563.000.
Kubanek, Emil. Electric operated automatic downrigger. 4,191,340, Cl. 242-54.00R.
Kubo, Kanji: *See*—
Furumoto, Mitsunobu; Yano, Osahiko; Kikuya, Satoshi; Kubo, Kanji; and Sakumoto, Hideki, 4,191,978, Cl. 360-75.000.
Kuczynski, Edward J.: *See*—
Stackman, Robert W.; and Kuczynski, Edward J., 4,191,681, Cl. 260-45.70P.
Kuehl, Guenter H., to Mobil Oil Corporation. Preparation of shape selective zeolite alpha as catalyst. 4,191,663, Cl. 252-455.00Z.
Kuehnel, Werner: *See*—
Kratz, Gerhard; and Kuehnel, Werner, 4,191,993, Cl. 363-135.000.
Kratz, Gerhard; and Kuehnel, Werner, 4,191,994, Cl. 363-135.000.
Kuhla, Donald E.: *See*—
Brennan, Thomas M.; Brannegan, Daniel P.; Weeks, Paul D.; and Kuhla, Donald E., 4,191,693, Cl. 260-345.90R.
Kulesza, Ralph J.; Wildman, John R.; Burck, Joseph M.; Meyer, Burton C.; and Wozniak, Walter J., to Marvin Glass & Associates. Projectile return apparatus with ball target area. 4,191,374, Cl. 273-30.000.
Kulesza, Ralph J.: *See*—
Meyer, Burton C.; Kulesza, Ralph J.; and Imatt, Alex, 4,191,370, Cl. 272-120.000.
Kulite Semiconductor Products, Inc.: *See*—
Kurtz, Anthony D., 4,192,005, Cl. 364-571.000.
Kumagai, Naotake, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Air conditioner operating apparatus. 4,191,242, Cl. 165-11.000.
Kumakura, Shokichi. Identification lamp apparatus. 4,191,988, Cl. 362-72.000.
Kunimasa, Oide, to Daichiku Co., Ltd. Wax treated grindstone. 4,190,986, Cl. 51-295.000.
Kuppenheimer, John D., to Sanders Associates, Inc. Cooled laser q-switch. 4,191,931, Cl. 331-94.50Q.
Kurahashi, Toshio: *See*—
Matsumoto, Hiromitsu; and Kurahashi, Toshio, 4,191,140, Cl. 123-52.0MB.
Kuramoto, Akio; and Kawai, Takeo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Dust seal. 4,191,272, Cl. 180-84.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Saitoh, Shigeru; and Suzuki, Noboru, 4,191,114, Cl. 110-248.000.
Kuroda, Michio; Yamazaki, Yoshiaki; Namura, Kiyoshi; Kato, Fumio; Akatsu, Yasuaki; Morimoto, Daizo; and Ninomiya, Satoshi, to Hitachi, Ltd.; and Hitachi Kizai Kogyo Co. Ltd. Turbine rotor construction. 4,191,508, Cl. 416-196.00R.
Kuroda, Michio: *See*—
Nakamura, Shozo; Kuroda, Michio; and Oshima, Ryoichiro, 4,191,021, Cl. 60-657.000.
Kurtz, Anthony D., to Kulite Semiconductor Products, Inc. Compensated pressure transducer employing digital processing techniques. 4,192,005, Cl. 364-571.000.
Kurumada, Tomoyuki: *See*—
Brunetti, Heimo; Rody, Jean; Soma, Nobuo; and Kurumada, Tomoyuki, 4,191,683, Cl. 260-45.80N.
Kusunoki, Shigeru: *See*—
Tanaka, Junzo; Kusunoki, Shigeru; and Yoshimura, Hirofumi, 4,191,877, Cl. 219-10.55B.
Kutzner, Luitpold: *See*—
Diermayer, Werner; and Kutzner, Luitpold, 4,191,326, Cl. 236-1.00G.
Kwantes, Arien; and Gautier, Pieter A., to Shell Oil Company. Preparation of bisphenols. 4,191,843, Cl. 568-728.000.
Kyte, Garrett J. Basket filler. 4,191,226, Cl. 141-391.000.
L. & C. Steinmuller GmbH: *See*—
Limper, Klaus, 4,191,642, Cl. 209-495.000.
Lachman, Irwin M.: *See*—
Armistead, William H.; and Lachman, Irwin M., 4,191,583, Cl. 106-39.600.
LaConti, Anthony B.: *See*—
Coker, Thomas G.; Dempsey, Russell M.; and LaConti, Anthony B., 4,191,618, Cl. 204-98.000.
Ladegast, Larry, Jr. Modular design of multi-sided awning for recreational vehicles. 4,191,418, Cl. 296-163.000.
Laird, William J.: *See*—
Campbell, Billy H.; Debona, Edward J.; and Laird, William J., 4,191,087, Cl. 89-1.806.
Lancellotti, William E. Tennis elbow brace. 4,191,373, Cl. 273-29.00A.
Land, Ferdinand: *See*—
Dessauer, Guido; Riecke, Kurt; and Land, Ferdinand, 4,191,403, Cl. 282-27.500.
Langdon, William K., to BASF Wyandotte Corporation. Process for preparing polyalkylene polyamine polyethers. 4,191,820, Cl. 528-405.000.
Lapple, Walter C.: *See*—
Boll, Richard H.; and Lapple, Walter C., 4,191,544, Cl. 55-390.000.
Large, George B.; and Buren, Lawrence, to Stauffer Chemical Company. Amine salts of substituted N-phosphonomethylureas and their use as plant growth regulators. 4,191,552, Cl. 71-86.000.
Larson, Daniel A., to Westinghouse Electric Corp. Starting arrangement for high pressure discharge sodium lamp. 4,191,910, Cl. 315-51.000.
Larson, Lars: *See*—
Hansson, Knut; and Larson, Lars, 4,191,493, Cl. 405-150.000.
Larson, Roger R., to Pharmaco, Inc. Device for holding membrane filter. 4,191,654, Cl. 210-451.000.
Larsson, Lars-Ake L.; and Traven, Lars J. C., to Gambro AB. Apparatus for conducting fluids in a dialysis system. 4,191,646, Cl. 210-103.000.
Larsson, Lars-Ake L.: *See*—
Andersson, Roland J. E.; Larsson, Lars-Ake L.; and Traven, Lars J. C., 4,191,359, Cl. 251-9.000.
Latham, David D.: *See*—
Miller, Wayne R.; Latham, David D.; and Spencer, Joseph C., 4,191,061, Cl. 74-108.000.
Laursen, Jens K.: *See*—
Christensen, Mogens A.; Hovmand, Svend; Laursen, Jens K.; and Mortensen, Henrik B., 4,190,963, Cl. 34-57.00A.
Lavnikov, Nikolai S.: *See*—
Antipov, Georgy A.; Gelfand, Mikhail L.; Lavnikov, Nikolai S.; Teres, Leonid N.; Urazhdin, Ivan I.; Tsipenjuk, Yakov I.; and Yakubovsky, Petr S., 4,191,264, Cl. 173-93.600.
Lawler, John T.: *See*—
Mattson, Frank J.; Lawler, John T.; Stegall, Jack L.; and Dawkins, Kenneth R., 4,191,209, Cl. 137-486.000.
Lawrence, Anthony J., to Tungum Hydraulics Limited. Method of assembling an actuator. 4,190,940, Cl. 29-156.40R.
Lawson, Leslie E., to Vickers Limited. Treating developed lithoplate with oleophilic composition. 4,191,569, Cl. 430-305.000.
Lawton, Kenneth L.: *See*—
Dean, Noel S.; Lawton, Kenneth L.; and Yates, Vincent A., 4,191,448, Cl. 350-96.230.
Leacock, James, to Halcon Research and Development Corp. Treatment of methacrolein-containing gases. 4,191,710, Cl. 260-601.00R.
Leal, Richard A.: *See*—
Reed, James, R.; Way, Terrance; and Leal, Richard A., 4,191,126, Cl. 118-50.000.

Lebowitz, Howard E.; Wolk, Ronald H.; Alpert, Seymour B.; Stewart, Norman C.; and Rovesti, William C., to Electric Power Research Institute, Inc. Synthetic liquid fuels. 4,191,700, Cl. 260-449.00M.

LeCaire, Robert A., Jr.; and Glashagel, Barry B., to Presto Products Incorporated. Dispenser for plastic bags. 4,191,307, Cl. 221-45.000.

Lechter, George S. Side collision safety seat belt structure. 4,191,421, Cl. 297-483.000.

Lecluse, Jean-Francois, to Agence Nationale de Valorisation de la Recherche (ANVAR). Control circuit for a DC electric motor particularly used in the propulsion of an electric vehicle. 4,191,914, Cl. 318-139.000.

Lee, Gim F., Jr.: *See*—
Haaf, William R.; and Lee, Gim F., Jr., 4,191,685, Cl. 260-45.95G.

Lee, Ronald N.: *See*—
Schwee, Leonard J.; Anderson, Wallace E.; Liu, Yuan-Jye; and Lee, Ronald N., 4,192,012, Cl. 365-87.000.

Lee, Yu-Sun; and Shackle, Dale R., to Mead Corporation, The. Process for producing a pressure-sensitive carbonless copy sheet using microcapsules formed in situ in a radiation curable binder. 4,191,404, Cl. 282-27.500.

Leesona Corporation: *See*—
Bradbury, Christopher G., 4,191,039, Cl. 72-60.000.

Leggett, Dudley W.: *See*—
Keats, Albert B.; and Leggett, Dudley W., 4,192,013, Cl. 365-91.000.

Le Guen, Yvon J.: *See*—
Cheysson, Philippe J.; Delons, Luc; and Le Guen, Yvon J., 4,191,651, Cl. 210-265.000.

Lehman, John C., to John C. Lehman, Inc. Cabinet storage conveyor. 4,191,435, Cl. 312-266.000.

Lehmann, Robert; Lyonnet, Andre; and Rochas, Paul, to Institut Textile de France; and Agence Nationale de Valorisation de la Recherche. Process and device for producing fancy yarn. 4,191,010, Cl. 57-208.000.

LeKander, William R., to Lyon Metal Products, Incorporated. Door closure apparatus. 4,191,412, Cl. 292-182.000.

Lembo, Michael J.; and Chen, James Y., to Belco Pollution Control Corporation. Regeneration of mixed resin bed used for condensate polishing. 4,191,644, Cl. 210-33.000.

Lemieux, Francis P., to Johnson & Johnson. Catheter assembly. 4,191,185, Cl. 128-214.400.

Lengyel, Ladislaus S.: *See*—
Kaplan, Stephen J.; and Lengyel, Ladislaus S., 4,191,648, Cl. 210-186.000.

Lenthe, Manfred; and Schwarz, Hans-Helmut, to Bayer Aktiengesellschaft. Process for the preparation of certain nuclear chlorinated benzotrichlorides. 4,191,711, Cl. 260-650.00R.

Leonardi, Salvatore A., to United Technologies Corporation. Rotor blade attachment. 4,191,509, Cl. 416-219.00R.

Leonhardt, Robert F., to Atwood Vacuum Machine Company. Pedestal for supporting a swivel seat in a vehicle. 4,191,353, Cl. 248-425.000.

Le Page, Jean-Francois: *See*—
Cosyns, Jean; Marcilly, Christian; Miquel, Jean; and Le Page, Jean-Francois, 4,191,632, Cl. 585-483.000.

Levi Strauss & Co.: *See*—
Blessing, Hubert, 4,191,118, Cl. 112-121.110.

Levin, Anne F.: *See*—
Levin, Paul D.; and Levin, Anne F., 4,191,950, Cl. 340-604.000.

Levin, Paul D.; and Levin, Anne F. Anti-bed-wetting device. 4,191,950, Cl. 340-604.000.

Levine, Peter A.; and Sauer, Donald J., to RCA Corporation. Low noise CCD input circuit. 4,191,895, Cl. 307-221.00D.

Levine, Peter A.: *See*—
Sauer, Donald J.; and Levine, Peter A., 4,191,896, Cl. 307-221.00D.

Levy, Isaac I., to ESB Incorporated. Pressure vent for a sealed primary cell. 4,191,806, Cl. 429-56.000.

Lewis, Jesse M. Method and means for treating timbers. 4,191,795, Cl. 427-351.000.

Lewis, Robert A.; and Honnen, Lewis R., to Chevron Research Company. Fuel compositions of poly(oxyalkylene) aminocarbamate. 4,191,537, Cl. 44-71.000.

Lewkowicz, Julian, to International Business Machines Corporation. Biasing of magnetoresistive read head using gyrators. 4,191,977, Cl. 360-66.000.

L'Heureux, Gerard. Process for reinsulating concrete block homes. 4,191,001, Cl. 52-743.000.

Liepmann, Hans; Hueschens, Rolf; Milkowski, Wolfgang; Zeugner, Horst; Heinemann, Henning; Wolf, Klaus-Ullrich; Hell, Insa; and Hempel, Reinhard, to Kali-Chemie Pharma GmbH. N_1-acyl-N_2-phenyldiaminopropanols and pharmaceutical compositions thereof. 4,191,770, Cl. 424-266.000.

Light, Steven D.; and Ward, John W., to Union Oil Company of California. Aromatization process and catalyst. 4,191,637, Cl. 208-139.000.

Limper, Klaus, to L. & C. Steinmuller GmbH. Method of separating granular pourable materials of different densities in a gaseous or liquid medium. 4,191,642, Cl. 209-495.000.

Lind, Frederick D.: *See*—
Shuck, William D.; Lind, Frederick D.; and Cole, John W., 4,191,479, Cl. 366-101.000.

Linde AG: *See*—
Heyl, Walter, 4,191,095, Cl. 92-78.000.

Lindfors, Kaj: *See*—
Stroucken, Klaus; Winberg, Torbjorn; and Lindfors, Kaj, 4,191,325, Cl. 233-20.00A.

Lindner, Christian; Suling, Carlhans; Bartl, Herbert; Schreckenberg, Manfred; Freitag, Dieter; and Konig, Klaus, to Bayer Aktiengesellschaft. Process for the preparation of carbonic acid esters of polyester-polyols. 4,191,705, Cl. 260-463.000.

Lindner, Ernst: *See*—
Fritsch, Werner; Stache, Ulrich; and Lindner, Ernst, 4,191,765, Cl. 424-248.530.

Lindquist, Terry K.: *See*—
Thelander, W. Vincent, Sr.; and Lindquist, Terry K., 4,191,285, Cl. 192-111.00A.

Lipsey, Elmer M., to Calorie Counter Limited Partnership. Electronic calorie counter. 4,192,000, Cl. 364-415.000.

Litchford, George B.: *See*—
Hulland, Burton L.; and Litchford, George B., 4,191,958, Cl. 343-105.00R.

Litwin, Bradley N. Fold-away stringed musical instrument. 4,191,085, Cl. 84-293.000.

Liu, Yuan-Jye: *See*—
Schwee, Leonard J.; Anderson, Wallace E.; Liu, Yuan-Jye; and Lee, Ronald N., 4,192,012, Cl. 365-87.000.

Loeding, John W.: *See*—
Patel, Jitendra G.; Schora, Frank C.; and Loeding, John W., 4,191,539, Cl. 48-210.000.

Loge, Olaf: *See*—
Skuballa, Werner; Raduchel, Bernd; Schwarz, Norbert; Vorbruggen, Helmut; Muller, Bernd; Mannesmann, Gerda; Loge, Olaf; Schillinger, Ekkehardt; and Casals-Stenzel, Jorge, 4,191,694, Cl. 260-346.220.

Long, David K., to National Semiconductor Corporation. Single slope A/D converter with sample and hold. 4,191,942, Cl. 340-347.0AD.

Lonza Ltd.: *See*—
Neri, Amleto; Sanchioni, Sergio; and Nava, Carlo, 4,191,695, Cl. 260-346.760.

Looser, Gottlieb. Winding apparatus and method. 4,191,341, Cl. 242-56.00A.

Lopata, John E.: *See*—
Bulanda, John J.; and Lopata, John E., 4,191,334, Cl. 24-16.0PB.

Lopez, Alfred R., to Hazeltine Corporation. Phased array antenna with reduced phase quantization error. 4,191,960, Cl. 343-854.000.

Lor, Inc.: *See*—
Rives, Allen K., 4,191,255, Cl. 166-297.000.

Lorain Products Corporation: *See*—
Becker, Dustin J., 4,192,007, Cl. 364-721.000.

Lotens, Jan P.: *See*—
Tels, Martinus; Lotens, Jan P.; and Kivits, Hendrikus P. M., 4,191,728, Cl. 423-24.000.

Louie, Albert: *See*—
Roth, Albert B.; and Louie, Albert, 4,191,016, Cl. 60-371.000.

Louis, Eckhart: *See*—
Schiller, August; Louis, Eckhart; Bosch, Erhard; and Braunsperger, Karl, 4,191,817, Cl. 528-38.000.

Lovelace, Donald E.: *See*—
Saarem, Myrl J.; Lovelace, Donald E.; Firebaugh, Dale C.; and Soukup, Dale F., 4,191,166, Cl. 126-430.000.

Lovell, James B.: *See*—
Drabb, Thomas W., Jr.; and Lovell, James B., 4,191,768, Cl. 424-251.000.

Luber, Edward J., Jr.: *See*—
Warner, Paul L., Jr.; and Luber, Edward J., Jr., 4,191,766, Cl. 424-250.000.
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Lubin, Patrice: *See*—
Chapelet, Gilbert; Lubin, Patrice; and Nouguier, Robert, 4,191,702, Cl. 260-453.0RY.

Lubrizol Corporation, The: *See*—
Davis, Kirk E., 4,191,659, Cl. 252-45.000.
Jahnke, Richard W., 4,191,658, Cl. 252-32.70E.
Jahnke, Richard W., 4,191,801, Cl. 428-467.000.

Luc, Andre R., to Tridon-Serflex S.A. Method of shaping a screw type clamping collar. 4,191,123, Cl. 113-116.00H.

Lucas Industries Limited: *See*—
Williams, Malcolm; Tingey, Albert R.; Southgate, John P.; and Russell, Steven J., 4,191,137, Cl. 123-32.0EH.
Yarrow, Christopher J., 4,191,902, Cl. 310-68.00D.

Lucas, Malcolm B.: *See*—
Byrd, Alan E.; Amneus, John S.; Lucas, Malcolm B.; Van Coney, Robert H.; and Van Loan, James E., 4,191,517, Cl. 425-286.000.

Luch, Daniel: *See*—
Hurley, John L.; Luch, Daniel; and Knipple, Charles J., 4,191,617, Cl. 204-40.000.

Luiz, Fernando A., to International Business Machines Corporation. Circuits and methods for multiple control in data processing systems. 4,191,997, Cl. 364-200.000.

Luwa AG: *See*—
Ferri, Johann W., 4,191,358, Cl. 251-5.000.

Luzzi, John J.: *See*—
Ramey, Chester E.; and Luzzi, John J., 4,191,682, Cl. 260-45.80N.
Ramey, Chester E.; and Luzzi, John J., 4,191,829, Cl. 546-222.000.

Lyman, Harold T., Jr. Navigation devices. 4,190,962, Cl. 33-363.00K.

Lyon Metal Products, Incorporated: *See*—
LeKander, William R., 4,191,412, Cl. 292-182.000.

Lyonnet, Andre: *See*—
Lehmann, Robert; Lyonnet, Andre; and Rochas, Paul, 4,191,010, Cl. 57-208.000.

Lyons, James E.; Shinn, Robert W.; and Suld, George, to Suntech, Inc. Direct oxidation of toluene to benzylidene diacetate. 4,191,839, Cl. 560-241.000.

Lyons, John E., to Eutectic Corporation. Method of applying a metal coating to a metal substrate. 4,191,791, Cl. 427-224.000.

Lyons, William E.; and Egan, John J., to Bauer Bros. Co., The. Infeed disc for disc-type refiners. 4,191,338, Cl. 241-245.000.

M&T Chemicals Inc.: *See*—
Beiter, Charles B.; and Hafner, Leroy A., 4,191,580, Cl. 106-16.000.

Macan Engineering & Manufacturing Company, Inc.: *See*—
Belt, Kenneth W.; and McCarrell, Stuart G., 4,191,188, Cl. 128-303.130.

Macart Textiles (Machinery) Limited: *See*—
Marshall, Brian, 4,191,222, Cl. 139-453.000.

MacChesney, John B.; O'Connor, Paul B.; and Pearson, Arthur D., to Bell Telephone Laboratories, Incorporated. Optical fiber fabrication process. 4,191,545, Cl. 65-3.00A.

Machida, Keisuke. Defrosting method and cooling apparatus in a refrigeration system. 4,191,024, Cl. 62-80.000.

MacTurk, William L., to General Dynamics Corporation Pomona Division. Method of constructing three-dimensionally curved, knit wire reflector. 4,191,604, Cl. 156-245.000.

Madden, Mark R.: *See*—
Jacobi, Edgar F.; and Madden, Mark R., 4,191,207, Cl. 137-344.000.

Madgavkar, Ajay M.: *See*—
Swift, Harold E.; Madgavkar, Ajay M.; and Vogel, Roger F., 4,191,733, Cl. 423-245.000.

Magee, Walter L., Jr., to Stauffer Chemical Company. Composition containing polymeric alkoxysilane and refractory material and method for preparing a mold based thereon. 4,191,582, Cl. 106-38.200.

Magnetic Peripherals Inc.: *See*—
Wood, William P.; and Jutila, Raymond E., 4,191,982, Cl. 360-123.000.

Maguire, Roy L.: *See*—
Roley, Robert D.; and Maguire, Roy L., 4,191,431, Cl. 305-18.000.

Makabe, Hachiro: *See*—
Eguchi, Yasukata; and Makabe, Hachiro, 4,191,121, Cl. 112-158.00B.

Makar, Andrew: *See*—
Schara, Robert E.; Keenberg, Larry E.; and Makar, Andrew, 4,191,781, Cl. 426-2.000.

Maldonado, Felipe, to Equipment Company of America. Internestable storage rack. 4,191,112, Cl. 108-53.300.

Maling, Peter J.: *See*—
Brook, Neil R.; and Maling, Peter J., 4,191,287, Cl. 198-472.000.

Mallick, Pankaj K.; and Raghupathi, Narasimhan, to Ford Motor Company. Thick section compression molded composites. 4,191,718, Cl. 264-26.000.

Malterer, Thomas J., to State of Minnesota as represented by the Commissioner of Natural Resources. Peat sampling probe. 4,191,263, Cl. 173-28.000.

Mandai, Harufumi, to Murata Manufacturing Co., Ltd. Barium titanate semiconductor ceramic compositions. 4,191,665, Cl. 252-520.000.

Mandeville, Gordon J., to Bell Telephone Laboratories, Incorporated. Wave digital filter with multiplexed arithmetic hardware. 4,192,008, Cl. 364-724.000.

Manley, Edward H.: *See*—
Faris, Charles G.; and Manley, Edward H., 4,191,954, Cl. 340-679.000.

Mannesmann, Gerda: *See*—
Skuballa, Werner; Raduchel, Bernd; Schwarz, Norbert; Vorbruggen, Helmut; Muller, Bernd; Mannesmann, Gerda; Loge, Olaf; Schillinger, Ekkehardt; and Casals-Stenzel, Jorge, 4,191,694, Cl. 260-346.220.

Mansfield, Martin J., Jr., to Cla-Mar International Corp. Safety harness kit. 4,191,275, Cl. 182-3.000.

Manufacture Francaise d'Appareils Electriques de Mesure: *See*—
Koehler, Gerard; Aguettaz, Jean; Berthelot, Alain; Genter, Claude; and Arnoux, Daniel, 4,191,937, Cl. 335-230.000.

Manzoni, Pier L.: *See*—
Vargiu, Silvio; Manzoni, Pier L.; and Bernasconi, Mario, 4,191,723, Cl. 264-129.000.

Marcilly, Christian: *See*—
Cosyns, Jean; Marcilly, Christian; Miquel, Jean; and Le Page, Jean-Francois, 4,191,632, Cl. 585-483.000.

Marconi Company Limited, The: *See*—
Schelisch, Ernst F., 4,191,923, Cl. 325-4.000.

Mares, Frank: *See*—
Tovrog, Benjamin S.; Diamond, Steven E.; and Mares, Frank, 4,191,696, Cl. 260-348.330.

Marich, Peter: *See*—
Morin, Wilfred F.; Martini, Joseph A.; Marich, Peter; and Gross, Harvey A., 4,191,378, Cl. 273-162.00R.

Marlen Research Corporation: *See*—
Alley, Lewis F.; and White, James E., 4,191,309, Cl. 222-1.000.

Marotta, Nicholas G.: *See*—
Nappen, Bernard H.; and Marotta, Nicholas G., 4,191,786, Cl. 426-593.000.

Marotta, Vincent G., to North American Systems, Inc. Brewing apparatus for coffee and the like. 4,191,100, Cl. 99-299.000.

Marquis, Edward T.; and Yeakey, Ernest L., to Texaco Development Corp. Aromatic amine-amides and use as chain-extenders. 4,191,706, Cl. 260-559.00A.

Marsh, Paul A., Jr.; and Thomas, Tom A., III. Filler panel clip for prestressed concrete double-tee roof or floor construction. 4,190,994, Cl. 52-262.000.

Marshall, Brian, to Macart Textiles (Machinery) Limited. Weft presenter mechanisms. 4,191,222, Cl. 139-453.000.

Marshall, Robert E.: *See*—
Polcyn, Fabian C.; Marshall, Robert E.; and Nichols, H. Janney, 4,191,940, Cl. 340-146.30B.

Marshall, Robert M., to Allied Chemical Corporation. Non-yellowing biocide for control of bacteria in spin finish emulsions used on nylon yarn. 4,191,656, Cl. 252-8.600.

Marti, Franz: *See*—
Riethmann, Jean; Marti, Franz; and Somlo, Tibor, 4,191,621, Cl. 204-158.0HA.

Martin, Howard; and Norris, James P. Endodontic drill-file. 4,190,958, Cl. 433-102.000.

Martin, Jerry D.: *See*—
Winchell, David A.; Martin, Jerry D.; and Roe, Frank L., 4,191,231, Cl. 150-8.000.

Martin, Paul F. Incubator openings. 4,191,174, Cl. 128-1.00B.

Martini, Joseph A.: *See*—
Morin, Wilfred F.; Martini, Joseph A.; Marich, Peter; and Gross, Harvey A., 4,191,378, Cl. 273-162.00R.

Marulic, Walter J.: *See*—
Ferris, Ray L.; and Marulic, Walter J., 4,191,107, Cl. 105-4.00R.

Marv Hodges, Inc.: *See*—
Hodges, Marvin P., 4,191,451, Cl. 350-126.000.

Marvin Glass & Associates: *See*—
Kulesza, Ralph J.; Wildman, John R.; Burck, Joseph M.; Meyer, Burton C.; and Wozniak, Walter J., 4,191,374, Cl. 273-30.000.
Meyer, Burton C.; Kulesza, Ralph J.; and Imatt, Alex, 4,191,370, Cl. 272-120.000.

Mascia, Carmen T., to Continental Group, Inc., The. Can opener. 4,190,956, Cl. 30-410.000.

Mascia, Carmen T.: *See*—
Hasegawa, Gary K.; and Mascia, Carmen T., 4,190,957, Cl. 30-411.000.

Masi, Paolo; Suarato, Antonino; Bernardi, Luigi; and Arcamone, Federico, to Farmitalia Carlo Erba S.p.A. Novel daunomycin derivatives, their aglycones and the use thereof. 4,191,755, Cl. 424-180.000.

Masi, Paolo; Suarato, Antonino; Bernardi, Luigi; and Arcamone, Federico, to Farmitalia Carlo Erba S.p.A. Daunomycin derivatives, their aglycones and the use thereof041913468. 4,191,756, Cl. 424-180.000.

Mason, Derek. Apparatus for the elevation of coins. 4,191,472, Cl. 356-243.000.

Mason, John H.: *See*—
Batha, Howard D.; Mason, John H.; and Thompson, Stanley R., 4,191,730, Cl. 423-239.000.

Massa, Donald P.: *See*—
Massa, Frank, 4,191,904, Cl. 310-322.000.

Massa, Frank, to Stoneleigh Trust, Fred M. Dellorfano, Jr. & Donald P. Massa, Trustees, The. Method of manufacturing electroacoustic transducer elements which operate in the vicinity of resonance. 4,190,937, Cl. 29-25.350.

Massa, Frank, to Dellorfano, Fred M., Jr.; and Massa, Donald P., Trustees of The Stoneleigh Trust. Electroacoustic transducers of the flexural resonant vibratile type. 4,191,904, Cl. 310-322.000.

Masuda, Toyoaki: *See*—
Ogawa, Akira; Masuda, Toyoaki; and Miura, Osamu, 4,191,101, Cl. 99-323.300.

Matchell, Raymond, to Rank Organisation Limited, The. Flying spot single field scan telecine apparatus. 4,191,972, Cl. 358-214.000.

Mather, Douglas E.; Messenger, Edward T.; and Phillips, Bryn M., to Albright & Wilson Ltd. Highly concentrated alkyl sulphate solutions pourable at ambient. 4,191,704, Cl. 260-459.00R.

Mathers, James E.; and Yale, Ramon L., to GTE Sylvania Incorporated. Y_2O_3:Eu phosphor having increased brightness. 4,191,662, Cl. 252-301.40R.

Matsubara, Hironaga: *See*—
Inagaki, Yutaka; Matsubara, Hironaga; and Ishise, Kojiro, 4,191,675, Cl. 260-29.300.

Matsuda, Atsushi; and Kishigami, Jun, to Sony Corporation. Support for multi-point magnetic driver loudspeaker. 4,191,863, Cl. 179-115.50R.

Matsuda, Genji; and Hosobuchi, Fumio, to Oriental Photo Industrial Co., Ltd. Means for guiding sheet-like printing paper. 4,191,369, Cl. 271-299.000.

Matsuda, Yoshio, to Yoshida Kogyo K.K. Slide fastener stringer. 4,190,935, Cl. 24-205.16C.

Matsumoto, Hiromitsu, to Yamaha Hatsudoki Kabushiki Kaisha. Combustion chamber of an internal combustion engine. 4,191,136, Cl. 123-30.00C.

Matsumoto, Hiromitsu; and Kurahashi, Toshio, to Yamaha Hatsudoki Kabushiki Kaisha. Induction flow guide device for internal combustion engine intake manifold. 4,191,140, Cl. 123-52.0MB.

Matsumoto, Hiromitsu: *See*—
Yamashita, Ryuichi; and Matsumoto, Hiromitsu, 4,191,716, Cl. 261-23.00A.

Matsushita Electric Industrial Co., Ltd.: *See*—
Furumoto, Mitsunobu; Yano, Osahiko; Kikuya, Satoshi; Kubo, Kanji; and Sakumoto, Hideki, 4,191,978, Cl. 360-75.000.
Minakuchi, Hiroshi, 4,191,927, Cl. 328-157.000.
Ohkubo, Masaru; and Onoda, Tadayuki, 4,191,876, Cl. 219-10.55B.
Takeshita, Masahiro; Kawashima, Kazumi; Ueda, Minoru; and Yamamoto, Keisuke, 4,191,924, Cl. 325-465.000.
Tanaka, Junzo; Kusunoki, Shigeru; and Yoshimura, Hirofumi, 4,191,877, Cl. 219-10.55B.
Yoshino, Hironori, 4,191,921, Cl. 324-54.000.

Mattal, Joseph P.: *See*—
Courten, Henry C.; and Mattal, Joseph P., 4,191,471, Cl. 356-154.000.
Mattila, Alvin J. Body massaging apparatus. 4,191,179, Cl. 128-58.000.
Mattson, Frank J.; Lawler, John T.; Stegall, Jack L.; and Dawkins, Kenneth R., to Aeronca, Inc. Air flow sensing device for air conditioning systems. 4,191,209, Cl. 137-486.000.
Mattson, Rodney A.: *See*—
Huang, Sung-Cheng; Brunnett, Carl J.; and Mattson, Rodney A., 4,191,892, Cl. 250-445.00T.
Maurine, Ronald J.: *See*—
King, Francis K.; Maurine, Ronald J.; and Wanek, Donald J., 4,191,980, Cl. 360-99.000.
Max, Solomon M.; and Weedon, Hans J., to Analogic Corporation. Isolation amplifier with high linearity. 4,191,929, Cl. 330-10.000.
Mayer, Max, to Siemens Aktiengesellschaft. Circuit arrangement for determining input signals which exceed a given minimum duration, in particular for teleprinter exchanges. 4,191,847, Cl. 178-3.000.
Mayer, Norbert: *See*—
Wiezer, Hartmut; Pfahler, Gerhard; Mayer, Norbert; and Knorr, Harald, 4,191,684, Cl. 260-48.5NT.
Mayr, Anton; Stickl, Helmut; and Westhues, Melchior. Preparation for the treatment of Herpes zoster and other Herpes infections, as well as method for manufacture thereof. 4,191,745, Cl. 424-90.000.
Mays, Robert K.: *See*—
Wason, Satish K.; and Mays, Robert K., 4,191,742, Cl. 424-49.000.
Mazey, David J.: *See*—
Nelson, Richard S.; Hudson, John A.; and Mazey, David J., 4,191,735, Cl. 423-446.000.
McAllister, Jack G. Frame assembly. 4,190,990, Cl. 52-66.000.
McAllister, John A.: *See*—
Thomas, Philip J.; and McAllister, John A., 4,190,952, Cl. 29-629.000.
McArthur, Dennis P., to Union Oil Company of California. Thermally stable nickel-alumina catalysts useful for methanation and other reactions. 4,191,664, Cl. 252-466.00J.
McCarrell, Stuart G.: *See*—
Belt, Kenneth W.; and McCarrell, Stuart G., 4,191,188, Cl. 128-303.130.
McDavid, Robert F. Athletic brassiere. 4,191,192, Cl. 128-457.000.
McDowell, William J., to United States of America, Energy. Process for removal of mineral particulates from coal-derived liquids. 4,191,628, Cl. 208-8.00R.
McGrath, James W., Jr.; and Seifried, Paul E., to American Cyanamid Company. Empty capsule ejector. 4,191,294, Cl. 209-135.000.
McIntyre, James D. E.: *See*—
Beni, Gerardo; Gottesfeld, Shimshon; McIntyre, James D. E.; and Shay, Joseph L., 4,191,453, Cl. 350-357.000.
McKay, Gordon. Ski covers. 4,191,233, Cl. 150-52.00R.
McKenna, John F., Jr.: *See*—
Bowditch, Philip N.; Dahlen, John M.; McKenna, John F., Jr.; Shillingford, John T., Jr.; Siraco, Frank J.; and Toth, William E., 4,191,049, Cl. 73-170.00A.
McKinniss, Chester L. Planetary transmission with plural power paths. 4,191,070, Cl. 74-682.000.
McLaughlin, Donald W., to Jusinskas, Julius, Jr.; and GTE Automatic Electric Laboratories Incorporated. Digital trunk supervisory decoder multiplexor for ground start or E&M signalling on a common T1 span. 4,191,857, Cl. 179-15.0BY.
McLean, LaVerne J., Mark A. McLean, and California Bank, trustees: *See*—
McLean, William B., deceased, 4,191,346, Cl. 244-3.160.
McLean, William B., deceased (by McLean, LaVerne J., Mark A. McLean, and California Bank, trustees), to Finch, Walter G. Target seeking gyro. 4,191,346, Cl. 244-3.160.
McMillan, Norman; and Dier, Henry M., to Dataproducts Corporation. Molded character belt with integral sleeves. 4,191,724, Cl. 264-255.000.
McMullan, James P. Bassinet. 4,190,916, Cl. 5-451.000.
Mead Corporation, The: *See*—
Lee, Yu-Sun; and Shackle, Dale R., 4,191,404, Cl. 282-27.500.
Meadows, George A., to Communications Satellite Corporation. Self-shielding small hole accel grid. 4,191,888, Cl. 250-396.00R.
"Meci" Materiel Electrique de Controle et Industriel: *See*—
Arvai, Tibor, 4,191,119, Cl. 112-158.00R.
Megapulse Incorporated: *See*—
Johannessen, Paul R., 4,191,992, Cl. 363-50.000.
Mendelson, Barry. Mixing chamber for use in plural medical liquid intravenous administration set. 4,191,183, Cl. 128-214.00R.
Merck & Co., Inc.: *See*—
Johnston, David B. R.; and Arth, Glen E., deceased, 4,191,759, Cl. 424-242.000.
Veber, Daniel F.; and Nutt, Ruth F., 4,191,754, Cl. 424-177.000.
Merck Patent Gesellschaft mit beschrankter Haftung: *See*—
Heusser, Dietrich; and Dingeldein, Elvira, 4,191,740, Cl. 424-14.000.
Klemm, Klaus; and Wahlig, Helmut, 4,191,743, Cl. 424-28.000.
Merger, Franz; Towae, Friedrich; and Penzel, Erich, to BASF Aktiengesellschaft. Acryloxy-alkylpropanals and methacryloxy-alkylpropanals. 4,191,838, Cl. 560-205.000.
Messenger, Edward T.: *See*—
Mather, Douglas E.; Messenger, Edward T.; and Phillips, Bryn M., 4,191,704, Cl. 260-459.00R.
Messenger, Joseph U., to Mobil Oil Corporation. Technique for cementing casing in an offshore well to seafloor. 4,191,250, Cl. 166-253.000.
Messerschmitt-Bolkow-Blohm GmbH: *See*—
Schindler, Rudolf; and Hartmann, Werner, 4,190,996, Cl. 52-309.130.
Messrs. BIG Spielwavenfabrik Dipl.-Ing. Ernst A. Bettag: *See*—
Rahmstorf, Dietmar, 4,190,982, Cl. 46-161.000.
Meyer, Burton C.; Kulesza, Ralph J.; and Imatt, Alex, to Marvin Glass & Associates. Pneumatic exercising device. 4,191,370, Cl. 272-120.000.
Meyer, Burton C.: *See*—
Kulesza, Ralph J.; Wildman, John R.; Burck, Joseph M.; Meyer, Burton C.; and Wozniak, Walter J., 4,191,374, Cl. 273-30.000.
Meyer, Fritz; Heine, Josef; and Vig, Ladislav, to Inventio AG. Apparatus for transmitting control signals to elevators or the like. 4,191,277, Cl. 187-29.00R.
Meyer, Rolf-Volker; Dhein, Rolf; Schneider, Kurt; and Fahnler, Friedrich, to Bayer Aktiengesellschaft. Activated anionic polymerization of lactam with partially masked polyisocyanate. 4,191,819, Cl. 528-315.000.
Meywald, Klaus; and Ohnmacht, Helmut, to Fritz Eichenauer, Firma. Heating element for electrical appliance having a blower. 4,191,880, Cl. 219-375.000.
Michlin, Irving R., to Transkrit Corporation. Form for control and/or recording purposes. 4,191,402, Cl. 282-23.00R.
Microlife Technics, Inc.: *See*—
Vedamuthu, Ebenezer R., 4,191,782, Cl. 426-38.000.
Microwave and Electronic System Limited: *See*—
Woode, Alan D., 4,191,953, Cl. 340-552.000.
Midland-Ross Corporation: *See*—
Conybear, James G.; and Titus, Wallace J., 4,191,598, Cl. 148-16.500.
Durling, Harold, 4,191,428, Cl. 303-6.00M.
Miki, Toshio; Fujita, Yoshiki; and Kawakami, Yoshihisa, to Koyo Seiko Company Limited. Seal assembly for bearing. 4,191,432, Cl. 308-187.000.
Milkowski, Wolfgang: *See*—
Liepmann, Hans; Hueschens, Rolf; Milkowski, Wolfgang; Zeugner, Horst; Heinemann, Henning; Wolf, Klaus-Ullrich; Hell, Insa; and Hempel, Reinhard, 4,191,770, Cl. 424-266.000.
Miller, Arthur, to Hewlett-Packard Company. Coupling circuit with driven guard. 4,191,195, Cl. 128-696.000.
Miller, Jean C.: *See*—
Conrad, Robert A.; Cullinan, George J.; Miller, Jean C.; and Gerzon, Koert, 4,191,688, Cl. 260-244.400.
Miller, Ronald E.: *See*—
Van Linden, Jan H. L.; Miller, Ronald E.; and Herrick, Joseph R., 4,191,559, Cl. 75-68.00R.
Miller, Stephen J., to Chevron Research Company. Octane upgrading process for light paraffins using a combination of two palladium-zeolite catalysts. 4,191,634, Cl. 208-65.000.
Miller, Wayne R.; Latham, David D.; and Spencer, Joseph C., to Deere & Company. Solenoid-operated fuel flow control for fuel injection system. 4,191,061, Cl. 74-108.000.
Milner, Brian R.: *See*—
ta Huang, Kwang; and Milner, Brian R., 4,191,986, Cl. 361-58.000.
Minakuchi, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Mixing circuit for digital signals. 4,191,927, Cl. 328-157.000.
Mineric Corporation: *See*—
Fischer, Arthur H.; Strow, Lawrence E.; and Bolth, Franklin A., 4,191,641, Cl. 209-166.000.
Minigrip, Inc.: *See*—
Ausnit, Steven, 4,191,230, Cl. 150-3.000.
Minnesota Mining and Manufacturing Company: *See*—
Keith, Roger H., 4,190,998, Cl. 52-591.000.
Minolta Camera Kabushiki Kaisha: *See*—
Watanabe, Yutaka; Yamagishi, Seiichi; and Toriumi, Shiro, 4,191,455, Cl. 353-27.00A.
Miquel, Jean: *See*—
Cosyns, Jean; Marcilly, Christian; Miquel, Jean; and Le Page, Jean-Francois, 4,191,632, Cl. 585-483.000.
Mitchell, David S.; and Sageman, David R., to Chevron Research Company. Carbon dioxide acceptor process using countercurrent plug flow. 4,191,540, Cl. 48-197.00R.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Noda, Masahiro; and Tokui, Kazuo, 4,191,894, Cl. 307-116.000.
Ono, Fumitaka; Semasa, Takayoshi; Ueno, Yutaka; and Iwata, Shuzi, 4,191,974, Cl. 358-261.000.
Tanaka, Katsufusa; and Tanakura, Isamu, 4,191,869, Cl. 200-61.45R.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Kumagai, Naotake, 4,191,242, Cl. 165-11.000.
Mitsubishi Petrochemical Co. Ltd.: *See*—
Seo, Iwao, 4,191,193, Cl. 128-675.000.
Mitsui Ocean Development & Engineering Co., Ltd.: *See*—
Muneta, Hiroto, 4,191,650, Cl. 210-242.00S.
Mitsui Sugar Co., Ltd.: *See*—
Yoshikazu, Nakajima; Kazumasa, Suzuki; and Tsuyoshi, Makino, 4,191,810, Cl. 435-177.000.
Mittleman, John; Warrell, Charles O.; and Peterson, Ronald S., to United States of America, Navy. Camera jig for underwater stereoscopic photography. 4,191,461, Cl. 354-64.000.
Miura, Osamu: *See*—
Ogawa, Akira; Masuda, Toyoaki; and Miura, Osamu, 4,191,101, Cl. 99-323.300.
Miura, Yoshiaki; Kaneyasu, Masataka; and Okamoto, Akira, to Nippon Steel Corporation. Wet process using steel slag for waste gas desulfurization. 4,191,731, Cl. 423-242.000.

Miya, Yukio: *See—*
Yasuda, Yuh; Kizaki, Sigeru; and Miya, Yukio, 4,191,905, Cl. 310-344.000.

Miyagi, Hideo: *See—*
Katahira, Eturou; Yamaguchi, Shunzo; Kida, Masashi; Ishida, Yasuhiko; and Miyagi, Hideo, 4,191,013, Cl. 60-276.000.

Miyoshi, Tsutomu; Yanagita, Shuichi; and Komachi, Yushi, to Tanita Corporation. Digital weighing machine. 4,191,268, Cl. 177-210.00C.

Mobil Oil Corporation: *See—*
Audeh, Costandi A.; and Johnson, George C., 4,191,639, Cl. 208-309.000.
Kuehl, Guenter H., 4,191,663, Cl. 252-455.00Z.
Messenger, Joseph U., 4,191,250, Cl. 166-253.000.
Plank, Charles J.; Rosinski, Edward J.; and Givens, Edwin N., 4,191,638, Cl. 208-139.000.

Mock, George E.: *See—*
Durr, Helmut E.; and Mock, George E., 4,191,339, Cl. 242-54.00R.

Mohler, Johann G. Sprinkler-sealing device. 4,191,257, Cl. 169-90.000.

Mojonnier Bros. Co.: *See—*
Mojonnier, Harry G.; and Skoli, Sigmund P., 4,191,784, Cl. 426-475.000.

Mojonnier, Harry G.; and Skoli, Sigmund P., to Mojonnier Bros. Co. Method for preparing a carbonated beverage. 4,191,784, Cl. 426-475.000.

Molina, Orlando G., to Rockwell International Corporation. Red-visible dye penetrant composition and method employing same. 4,191,048, Cl. 73-104.000.

Monarch Marking System, Inc.: *See—*
Bussard, Charles B.; and Jenkins, William A., 4,191,608, Cl. 156-584.000.

Moncrief, Jack W.: *See—*
Popovich, Robert P.; Antwiler, Glen D.; and Moncrief, Jack W., 4,191,182, Cl. 128-214.00R.

Monie, Yvan: *See—*
Beghi, Rene; Desmars, Gabriel; Monie, Yvan; and Pessayre, Raymond, 4,191,300, Cl. 212-41.000.

Monsanto Company: *See—*
Wu, Chester C.; and Garner, Albert Y., 4,191,715, Cl. 260-927.00N.

Monteith, Donald A., to Steiger Tractor, Inc. Control for tractor power takeoff shaft. 4,191,270, Cl. 180-53.00D.

Montgomery, Harry T.; and Nagati, Rashed N., to Pennsylvania Engineering Corporation. Support for metallurgical vessels. 4,191,364, Cl. 266-246.000.

Montress, Gary K.; Grudkowski, Thomas W.; and Reeder, Thomas M., to United Technologies Corporation. Differential mixing surface acoustic wave signal processor. 4,191,933, Cl. 333-151.000.

Moody, Roy A.: *See—*
Caveney, Jack E.; and Moody, Roy A., 4,191,442, Cl. 339-99.00R.

Moodysson, Bengt-Ove M.: *See—*
Bratt, Jan C.; Moodysson, Bengt-Ove M.; and Rosenqvist, Nils K. G., 4,191,019, Cl. 60-525.000.

Mookherjee, Braja D.: *See—*
Withycombe, Donald A.; Mookherjee, Braja D.; Vock, Manfred H.; and Vinals, Joaquin F., 4,191,785, Cl. 426-536.000.

Moore, David M., to Armstrong Store Fixture Corporation. Partition with resilient tongues for engaging perforated shelving. 4,191,299, Cl. 211-184.000.

Morgan Construction Company: *See—*
Salter, Lowell S., Jr., 4,191,042, Cl. 72-247.000.

Morgan, J. Robert. Article dispensing rack. 4,191,296, Cl. 211-49.00D.

Morgunsky, Evgeny I.; Sidorenko, Valery A.; and Plotnikov, Vladmir A., to Fiziko-Teknichesky Institut Akademii Nauk Belorusskoi SSR. Rotary cutting tool. 4,191,075, Cl. 82-36.00R.

Mori, Toshio: *See—*
Kojimoto, Susumu; Sato, Takami; and Mori, Toshio, 4,191,518, Cl. 425-326.100.

Morimoto, Daizo: *See—*
Kuroda, Michio; Yamazaki, Yoshiaki; Namura, Kiyoshi; Kato, Fumio; Akatsu, Yasuaki; Morimoto, Daizo; and Ninomiya, Satoshi, 4,191,508, Cl. 416-196.00R.

Morimoto, Hiroshi: *See—*
Yamamura, Yuichi; Azuma, Ichiro; Sugimura, Kazuhisa; Morimoto, Hiroshi; Imada, Isuke; and Watanabe, Masazumi, 4,191,778, Cl. 424-317.000.

Morin, Wilfred F.; Martini, Joseph A.; Marich, Peter; and Gross, Harvey A. Golf putter with detachable magnetic tape player cartridge. 4,191,378, Cl. 273-162.00R.

Morishita, Yasomatsu, to Ryobi, Ltd. Spinning reel with improved drag and spool oscillation mechanisms. 4,191,343, Cl. 242-84.21R.

Morita, Kazuyoshi: *See—*
Kada, Tsuneo; Inoue, Tadashi; and Morita, Kazuyoshi, 4,191,752, Cl. 424-177.000.

Moroz, Jury A.: *See—*
Grigorenko, Anatoly S.; Moroz, Jury A.; Kortusov, Leonid I.; Bocharov, Jury A.; and Safonov, Anatoly V., 4,191,044, Cl. 72-354.000.

Morrell, Jacque C. Process for the production of shale oil from oil shales. 4,191,630, Cl. 208-11.00R.

Morris, James C.: *See—*
Bouchard, Andre C.; Morris, James C.; and Garrison, Robert L., 4,191,947, Cl. 340-531.000.

Morrison, Donald R. Concrete reinforcement mesh lifting tool. 4,191,360, Cl. 254-129.000.

Mortensen, Henrik B.: *See—*
Christensen, Mogens A.; Hovmand, Svend; Laursen, Jens K.; and Mortensen, Henrik B., 4,190,963, Cl. 34-57.00A.

Morton, Jarred: *See—*
Kerner, William R.; and Morton, Jarred, 4,192,010, Cl. 364-900.000.

Moser, Roland: *See—*
Habermeier, Jurgen; and Moser, Roland, 4,191,835, Cl. 560-49.000.
Habermeier, Jurgen; and Moser, Roland, 4,191,836, Cl. 560-49.000.

Motoren- und Turbinen-Union Friedrichshafen GmbH: *See—*
Deutschmann, Herbert, 4,191,152, Cl. 123-119.00C.

Motorola Inc.: *See—*
Piesinger, Gregory H., 4,191,853, Cl. 179-1.0SA.
Ulmer, Richard W., 4,191,898, Cl. 307-264.000.

Mougin, Georges L., to ITI Limited. Creating and maintaining a pool of fresh water on a tabular iceberg. 4,191,491, Cl. 405-52.000.

Moyer, Charles E., Jr.; Keller, George E., II; Beisner, Robert W.; and Walker, Wellington E., to Union Carbide Corporation. Alcohol separation. 4,191,701, Cl. 260-450.000.

Mueller, Hans W., to SCM Corporation. Typewriter key action. 4,191,483, Cl. 400-369.000.

Muldery, Hendrikus; and Schubert, Heinz. Battery moulding of panels. 4,191,521, Cl. 425-432.000.

Muldner, Lawrence C. Mat for growing lawns or other vegetation. 4,190,981, Cl. 47-56.000.

Muller, Bernd: *See—*
Skuballa, Werner; Raduchel, Bernd; Schwarz, Norbert; Vorbruggen, Helmut; Muller, Bernd; Mannesmann, Gerda; Loge, Olaf; Schillinger, Ekkehardt; and Casals-Stenzel, Jorge, 4,191,694, Cl. 260-346.220.

Muller, Erich: *See—*
Nicki, Josef; Muller, Erich; Narr, Berthold; Haarmann, Walter; Schroter, Wolfgang; and Kadatz, Rudolf, 4,191,776, Cl. 424-308.000.

Muller, Rolf; and Ribka, Joachim, to Cassella Aktiengesellschaft. Process for preparing fiber-reactive phthalocyanine azo dyes. 4,191,686, Cl. 260-147.000.

Mullerheim, Steven B.; and Williams, Fred G., Jr., to Great Circle Associates. Filtration system for household sewage. 4,191,647, Cl. 210-128.000.

Multilam Corporation: *See—*
Deal, Robert S., 4,191,445, Cl. 339-252.00R.

Mundell, Donald D., to Flex-o-lators, Inc. Support grid for upholstered seating. 4,191,424, Cl. 297-459.000.

Muneta, Hiroto, to Mitsui Ocean Development & Engineering Co., Ltd. Oil-collecting ship for oil spills. 4,191,650, Cl. 210-242.00S.

Munson, Loren R.: *See—*
Josefson, Arnold J.; and Munson, Loren R., 4,191,624, Cl. 204-181.00T.

Murakami, Hiroyashu: *See—*
Kawamura, Masaharu; Sakurada, Nobuaki; Shinoda, Nobuhiko; Ito, Fumio; Murakami, Hiroyashu; and Ito, Tadashi, 4,191,458, Cl. 354-23.00D.

Murata Manufacturing Co., Ltd.: *See—*
Mandai, Harufumi, 4,191,665, Cl. 252-520.000.

Murphy Chemical Company Limited, The: *See—*
Pianka, Max, 4,191,757, Cl. 424-225.000.

Murphy, Kent D. Advertising or novelty device. 4,190,975, Cl. 40-2.00A.

Murray, Thomas E.: *See—*
Anderson, Arthur H.; and Murray, Thomas E., 4,191,327, Cl. 236-42.000.

Musgrave, Harry J. Chick processing apparatus. 4,191,130, Cl. 119-22.000.

Myers, Dick T. Belt having a posture warning device. 4,191,949, Cl. 340-573.000.

Mylander, Gerald D. Automatic fill-stop valve. 4,191,208, Cl. 137-393.000.

N.A.D., Inc.: *See—*
Schreiber, Peter J.; and Schreiber, Joachim G. M., 4,191,952, Cl. 340-611.000.

N L Industries, Inc.: *See—*
Roth, Albert B.; and Louie, Albert, 4,191,016, Cl. 60-371.000.
Sallman, Charles M., 4,191,525, Cl. 432-21.000.

Nadelson, Jeffrey, to Sandoz, Inc. Substituted 4-hydroxy pyridones. 4,191,827, Cl. 546-116.000.

Naf, Hans: *See—*
Stillhard, Bruno; and Naf, Hans, 4,191,726, Cl. 264-517.000.

Nagahama, Yasuo, to Nippon Gakki Seizo Kabushiki Kaisha. Voltage-controlled oscillator. 4,191,932, Cl. 331-111.000.

Nagano, Katsumi; and Taguchi, Yasuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Analog multiplexer. 4,191,856, Cl. 179-15.00A.

Nagarajan, Ramakrishnan: *See—*
Gorman, Marvin; Higgens, Calvin E.; and Nagarajan, Ramakrishnan, 4,191,763, Cl. 424-246.000.

Nagashima, Tomoyuki; Tanaka, Masayuki; and Shinomiya, Shigeo, to Honda Giken Kogyo Kabushiki Kaisha. Vehicle body frame arrangement. 4,191,269, Cl. 180-27.000.

Nagati, Rashed N.: *See—*
Montgomery, Harry T.; and Nagati, Rashed N., 4,191,364, Cl. 266-246.000.

Nagatsu, Toshiharu; and Sakakibara, Shumpei, to Ajinomoto Co., Inc. Method of measuring dipeptidyl-amino-peptidase activity. 4,191,808, Cl. 435-24.000.

Nagatsu, Toshiharu; and Sakakibara, Shumpei, to Ajinomoto Co., Inc. Method of measuring enzymatic activity using novel peptide derivatives. 4,191,809, Cl. 435-24.000.

Nagle, William L. Method and apparatus for repetitively producing a noise-like audible signal. 4,191,175, Cl. 128-1.00C.

Naidus, Edward S., to RCA Corporation. Double dome heat and smoke vent structure. 4,190,987, Cl. 52-1.000.
Naifeh, Woodrow W. Adjustable spring tension pocketknife. 4,190,953, Cl. 30-155.000.
Nakaguti, Osamu: *See*—
Kamiya, Takashi; Teraji, Tsutomu; Hashimoto, Masashi; Nakaguti, Osamu; and Oku, Teruo, 4,191,762, Cl. 424-246.000.
Nakajima, Kunihiko; Sato, Kyoshi; Iio, Toshimitsu; and Kanda, Atsushi, to Yamaha Hatsudoki Kabushiki Kaisha. Three-function switch for a motorcycle. 4,191,866, Cl. 200-4.000.
Nakajima, Yoshiyuki: *See*—
Kadono, Mamoru; Saigusa, Tetsuji; Nakajima, Yoshiyuki; and Koga, Tomohiro, 4,191,217, Cl. 138-109.000.
Nakamae, Masahiko: *See*—
Aomura, Kunio; Tokuyoshi, Fujiki; and Nakamae, Masahiko, 4,191,595, Cl. 148-1.500.
Nakamura, Koji; Ogata, Masaru; and Nakatsuka, Takuzo, to Shibata Kogyo Co., Ltd; and Nippon Kokan Kabushiki Kaisha. Apparatus of effecting buoyancy on submerged articles. 4,191,494, Cl. 405-171.000.
Nakamura, Shozo; Kuroda, Michio; and Oshima, Ryoichiro, to Hitachi, Ltd. Small power plant utilizing waste heat. 4,191,021, Cl. 60-657.000.
Nakano, Jiro: *See*—
Nohira, Hidetaka; Kobashi, Kiyoshi; and Nakano, Jiro, 4,191,144, Cl. 123-117.00R.
Nakatsuka, Takuzo: *See*—
Nakamura, Koji; Ogata, Masaru; and Nakatsuka, Takuzo, 4,191,494, Cl. 405-171.000.
Namura, Kiyoshi: *See*—
Kuroda, Michio; Yamazaki, Yoshiaki; Namura, Kiyoshi; Kato, Fumio; Akatsu, Yasuaki; Morimoto, Daizo; and Ninomiya, Satoshi, 4,191,508, Cl. 416-196.00R.
Napco Security System Inc.: *See*—
Stockdale, Roy, 4,191,948, Cl. 340-539.000.
Nappen, Bernard H.; and Marotta, Nicholas G., to National Starch and Chemical Corporation. Preparation of dispersible chocolate liquor by extrusion. 4,191,786, Cl. 426-593.000.
Narr, Berthold: *See*—
Nickl, Josef; Muller, Erich; Narr, Berthold; Haarmann, Walter; Schroter, Wolfgang; and Kadatz, Rudolf, 4,191,776, Cl. 424-308.000.
Nash, Franklin A. Thermoplastic check valve. 4,191,205, Cl. 137-375.000.
National Optronics, Incorporated: *See*—
Sinklier, Robert W.; and Venditto, Virgil A., Jr., 4,191,501, Cl. 409-104.000.
National Research Development Corporation: *See*—
Nelson, Richard S.; Hudson, John A.; and Mazey, David J., 4,191,735, Cl. 423-446.000.
Pollard, Harry C., 4,191,476, Cl. 356-349.000.
Wright, Basil M., 4,191,187, Cl. 128-218.00A.
National Semiconductor Corporation: *See*—
Long, David K., 4,191,942, Cl. 340-347.0AD.
Redfern, Thomas P.; Connolly, Joseph J.; and Frederiksen, Thomas M., 4,191,900, Cl. 307-355.000.
National Starch and Chemical Corporation: *See*—
Nappen, Bernard H.; and Marotta, Nicholas G., 4,191,786, Cl. 426-593.000.
Nav-All, Incorporated: *See*—
Draper, George L., 4,192,002, Cl. 364-449.000.
Nava, Carlo: *See*—
Neri, Amleto; Sanchioni, Sergio; and Nava, Carlo, 4,191,695, Cl. 260-346.760.
NCR Corporation: *See*—
Craycraft, Donald G., 4,192,014, Cl. 365-104.000.
Neff, Robert O.; White, Arthur K.; and Hahn, Norbert, to Rite-Hite Corporation. Device for releasably securing one unit against a second unit. 4,191,503, Cl. 414-401.000.
Nehring, John R., to International Paper Company. Pressure responsive fluid collection system. 4,191,204, Cl. 137-205.000.
Nelles, Wilhelm. Expanding fixture and hammering device therefor. 4,190,991, Cl. 52-127.000.
Nelson, David J. Sash tie and holder. 4,190,904, Cl. 2-137.000.
Nelson, Delbert G.: *See*—
Krolak, Ronald L.; and Nelson, Delbert G., 4,191,401, Cl. 280-796.000.
Nelson, Donald C. Collapsible playhouse made of two equal parts. 4,190,978, Cl. 46-12.000.
Nelson, Larry A., to Tektronix, Inc. Apparatus and method for testing color sequencing of secam color television signals. 4,191,965, Cl. 358-10.000.
Nelson, Richard S.; Hudson, John A.; and Mazey, David J., to National Research Development Corporation. Growth of synthetic diamonds. 4,191,735, Cl. 423-446.000.
Neri, Amleto; Sanchioni, Sergio; and Nava, Carlo, to Lonza Ltd. Process for obtaining maleic acid anhydride. 4,191,695, Cl. 260-346.760.
Nesbitt, James G. Duplicator for bowling ball finger and thumb holes. 4,191,357, Cl. 249-205.000.
Newman, Morris M. Blister package. 4,191,293, Cl. 206-467.000.
NGK Spark Plug Co., Ltd.: *See*—
Nishio, Kanemitsu; Yoshida, Mitsutaka; Suzuki, Takashi; and Sunohara, Junji, 4,191,155, Cl. 123-148.00P.
Ni Fan, Roxy: *See*—
Cohen, Abraham B.; and Ni Fan, Roxy, 4,191,572, Cl. 430-260.000.
Nicholls, Anthony T., to Chloride Group Limited. Automatic electric battery charging apparatus. 4,191,918, Cl. 320-23.000.
Nichols, H. Janney. *See*—
Polcyn, Fabian C.; Marshall, Robert E.; and Nichols, H. Janney, 4,191,940, Cl. 340-146.30B.
Nicholson, James A. Animal grooming device. 4,190,924, Cl. 15-402.000.
Nickl, Josef; Muller, Erich; Narr, Berthold; Haarmann, Walter; Schroter, Wolfgang; and Kadatz, Rudolf, to Boehringer Ingelheim GmbH. Biphenyl derivatives. 4,191,776, Cl. 424-308.000.
Niebylski, Leonard M., to Ethyl Corporation. Fuel compositions for reducing combustion chamber deposits and hydrocarbon emissions of internal combustion engines. 4,191,536, Cl. 44-63.000.
Niederst, Jean-Pierre; and Holzinger, Karl, to Herbert Kannegiesser Kommanditgesellschaft. Press apparatus for molding shaped bodies from foamable plastic materials. 4,191,523, Cl. 425-589.000.
Niemann, Heinz, to ESGE-Marby GmbH & Co. Bicycle luggage carrier attachment arrangement. 4,191,393, Cl. 280-289.00A.
Nihon Beru-Haueru Kabushiki Kaisha (Bell & Howell Japan, Ltd.): *See*—
Sato, Hideharu, 4,191,882, Cl. 250-201.000.
Nilsson, Lars A. H. Lifting device. 4,190,912, Cl. 5-83.000.
Ninomiya, Satoshi: *See*—
Kuroda, Michio; Yamazaki, Yoshiaki; Namura, Kiyoshi; Kato, Fumio; Akatsu, Yasuaki; Morimoto, Daizo; and Ninomiya, Satoshi, 4,191,508, Cl. 416-196.00R.
Nippon Electric Co., Ltd.: *See*—
Aomura, Kunio; Tokuyoshi, Fujiki; and Nakamae, Masahiko, 4,191,595, Cl. 148-1.500.
Araseki, Takashi, 4,191,858, Cl. 179-15.550.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Koike, Masahiko, 4,191,082, Cl. 84-1.190.
Nagahama, Yasuo, 4,191,932, Cl. 331-111.000.
Nippon Kokan Kabushiki Kaisha: *See*—
Nakamura, Koji; Ogata, Masaru; and Nakatsuka, Takuzo, 4,191,494, Cl. 405-171.000.
Nippon Soken, Inc.: *See*—
Katahira, Eturou; Yamaguchi, Shunzo; Kida, Masashi; Ishida, Yasuhiko; and Miyagi, Hideo, 4,191,013, Cl. 60-276.000.
Nippon Steel Corporation: *See*—
Miura, Yoshiaki; Kaneyasu, Masataka; and Okamoto, Akira, 4,191,731, Cl. 423-242.000.
Nishikawa, Masao; and Yamamoto, Hitoshi, to Honda Giken Kogyo Kabushiki Kaisha. Damping-force control mechanism in a hydraulic shock absorber. 4,191,281, Cl. 188-319.000.
Nishikawa, Masao, to Shin-Shirasuna Electric Corporation. Stereophonic sense enhancing apparatus. 4,191,852, Cl. 179-1.00G.
Nishio, Kanemitsu; Yoshida, Mitsutaka; Suzuki, Takashi; and Sunohara, Junji, to NGK Spark Plug Co., Ltd. Internal combustion engine ignition noise preventing device. 4,191,155, Cl. 123-148.00P.
Nissan Motor Company, Limited: *See*—
Inasawa, Hideho; and Akiyama, Yoshinori, 4,191,422, Cl. 297-391.000.
Nissoux, Jean L.: *See*—
Ray, Michel; and Nissoux, Jean L., 4,191,489, Cl. 404-51.000.
Nist, Edward. Lift assembly. 4,191,416, Cl. 294-74.000.
Noda, Masahiro; and Tokui, Kazuo, to Mitsubishi Denki Kabushiki Kaisha. Proximity detector. 4,191,894, Cl. 307-116.000.
Nohira, Hidetaka; Ito, Sumio; and Ohki, Hisashi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Combustion chamber of an internal combustion engine. 4,191,135, Cl. 123-30.00C.
Nohira, Hidetaka; Kobashi, Kiyoshi; and Nakano, Jiro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method for controlling ignition timing in an internal combustion engine. 4,191,144, Cl. 123-117.00R.
Nolte, Hans-Henning, to BFG Glassgroup. Method of forming a layer of material from a solution. 4,191,805, Cl. 428-539.000.
Nonogaki, Saburo; Kohashi, Takahiro; and Hatano, Yoshio, to Hitachi, Ltd. Method of pattern forming in a photosensitive composition having a reciprocity law failing property. 4,191,571, Cl. 430-335.000.
Norris, James P.: *See*—
Martin, Howard; and Norris, James P., 4,190,958, Cl. 433-102.000.
Norris, Jeffery G.: *See*—
Fassett, Kendall G.; and Norris, Jeffery G., 4,191,420, Cl. 297-194.000.
Norsk Hydro A.S.: *See*—
Skaadel, Johannes; and Omdal, Bjarne, 4,191,229, Cl. 150-1.000.
North American Systems, Inc.: *See*—
Marotta, Vincent G., 4,191,100, Cl. 99-299.000.
Nouguier, Robert: *See*—
Chapelet, Gilbert; Lubin, Patrice; and Nouguier, Robert, 4,191,702, Cl. 260-453.0RY.
Novo Laboratories, Inc.: *See*—
Spina, Joseph; and Weibel, Michael K., 4,191,176, Cl. 128-1.00R.
Nutt, Ruth F.: *See*—
Veber, Daniel F.; and Nutt, Ruth F., 4,191,754, Cl. 424-177.000.
N.V. Optische Industrie "De Oude Delft": *See*—
Geluk, Ronald J., 4,191,890, Cl. 250-402.000.
Oberg, Carl L.; and Hood, George A., to Rockwell International Corporation. Dense-phase feeder method. 4,191,500, Cl. 406-146.000.
O'Brien, Douglas W.: *See*—
King, John A.; and O'Brien, Douglas W., 4,191,865, Cl. 179-178.000.
Occidental Oil Shale, Inc.: *See*—
Cha, Chang Y., 4,191,251, Cl. 166-260.000.
O'Connor, Paul B.: *See*—
MacChesney, John B.; O'Connor, Paul B.; and Pearson, Arthur D., 4,191,545, Cl. 65-3.00A.

Ogata, Masaru: *See*—
Nakamura, Koji; Ogata, Masaru; and Nakatsuka, Takuzo, 4,191,494, Cl. 405-171.000.
Ogawa, Akira; Masuda, Toyoaki; and Miura, Osamu, to Toshiba Kikai Kabushiki Kaisha. Apparatus for preparing a cup of hot drink. 4,191,101, Cl. 99-323.300.
Ogle, Robert W., to IMS Limited. Pharmaceutical cocktail package. 4,191,225, Cl. 141-329.000.
O'Grady, Timothy J.: *See*—
Dollman, David Y.; and O'Grady, Timothy J., 4,191,596, Cl. 148-6.270.
Ohi, Fumio: *See*—
Okabe, Hiromichi; Kishimoto, Kiyomi; and Ohi, Fumio, 4,191,708, Cl. 260-582.000.
Ohkawa, Fujio: *See*—
Kataoka, Nobuyuki; Takahashi, Takuya; Ohkawa, Fujio; and Anzai, Shiro, 4,191,671, Cl. 260-23.70M.
Ohki, Hisashi: *See*—
Nohira, Hidetaka; Ito, Sumio; and Ohki, Hisashi, 4,191,135, Cl. 123-30.00C.
Ohkubo, Masaru; and Onoda, Tadayuki, to Matsushita Electric Industrial Co., Ltd. Microwave oven having radiation detector. 4,191,876, Cl. 219-10.55B.
Ohlsson, Jarl E. S. I., to Sisenca S.A. Printing apparatus. 4,191,105, Cl. 101-415.100.
Ohnmacht, Helmut: *See*—
Meywald, Klaus; and Ohnmacht, Helmut, 4,191,880, Cl. 219-375.000.
Oishi, Masaaki; Ashida, Itaru; and Suzuki, Tetsuro, to Kabushiki Kaisha Seikosha. Ratchet feed mechanism. 4,191,067, Cl. 74-577.00M.
Okabe, Hiromichi; Kishimoto, Kiyomi; and Ohi, Fumio, to Sumitomo Chemical Company, Limited. Process for preparing and purifying p-phenylenediamine. 4,191,708, Cl. 260-582.000.
Okabe, Katsuhiko, to Copal Company Limited. Printer having swingable printing character supporting endless belts. 4,191,104, Cl. 101-93.140.
Okamoto, Akira: *See*—
Miura, Yoshiaki; Kaneyasu, Masataka; and Okamoto, Akira, 4,191,731, Cl. 423-242.000.
Okita, Tsutomu; Satou, Masami; Hibino, Noburo; Katoh, Kazunobu; and Sugiyama, Masatoshi, to Fuji Photo Film Co., Ltd. Photographic polyester film support. 4,191,679, Cl. 260-40.00R.
Oku, Teruo: *See*—
Kamiya, Takashi; Teraji, Tsutomu; Hashimoto, Masashi; Nakaguti, Osamu; and Oku, Teruo, 4,191,762, Cl. 424-246.000.
Oldani, Melchiorre: *See*—
Teglund, Lars; and Oldani, Melchiorre, 4,190,910, Cl. 4-421.000.
Olin Corporation: *See*—
Specht, Steven J., 4,191,627, Cl. 204-296.000.
Olson, Harlan D.: *See*—
Farmer, Stanley E.; and Olson, Harlan D., 4,191,276, Cl. 187-9.00E.
Omdal, Bjarne: *See*—
Skaadel, Johannes; and Omdal, Bjarne, 4,191,229, Cl. 150-1.000.
Omnewtronics, Inc.: *See*—
Strem, Robert C.; Strem, R. C.; and Eberle, John H., 4,191,153, Cl. 123-133.000.
O'Neal, Charles D., III; Blumle, Leo J.; and Hablanian, Marsbed, to Varian Associates, Inc. Apparatus and method for controlling pressure ratio in high vacuum vapor pumps. 4,191,512, Cl. 417-54.000.
O'Neill, Charles F., to Burroughs Corporation. Horizontal/inclined substrate holder for liquid phase epitaxy. 4,191,365, Cl. 269-46.000.
Onishi, Hiroaki: *See*—
Sato, Katsutoshi; Ito, Susumu; Kanaya, Tadashi; Onishi, Hiroaki; Ichiishi, Tsuneo; and Osaka, Akira, 4,191,286, Cl. 193-40.000.
Ono, Fumitaka; Semasa, Takayoshi; Ueno, Yutaka; and Iwata, Shuzi, to Mitsubishi Denki Kabushiki Kaisha. Facsimile encoding communication system. 4,191,974, Cl. 358-261.000.
Onoda, Tadayuki: *See*—
Ohkubo, Masaru; and Onoda, Tadayuki, 4,191,876, Cl. 219-10.55B.
Orem, Donald E.; Holmes, Vernon P.; and Bacsanyi, Thomas J., to Ransburg Corporation. Dynamic imbalance determining system. 4,191,055, Cl. 73-462.000.
Oriental Photo Industrial Co., Ltd.: *See*—
Matsuda, Genji; and Hosobuchi, Fumio, 4,191,369, Cl. 271-299.000.
Orion Machinery & Engineering Corp.: *See*—
Steinhilber, Wilhelm A., 4,191,078, Cl. 83-320.000.
Ormond, William. Storable holder for a container. 4,191,350, Cl. 248-293.000.
Orner, George M.: *See*—
Audet, Norman F.; and Orner, George M., 4,191,028, Cl. 62-259.000.
Osaka, Akira: *See*—
Sato, Katsutoshi; Ito, Susumu; Kanaya, Tadashi; Onishi, Hiroaki; Ichiishi, Tsuneo; and Osaka, Akira, 4,191,286, Cl. 193-40.000.
Oshima, Ryoichiro: *See*—
Nakamura, Shozo; Kuroda, Michio; and Oshima, Ryoichiro, 4,191,021, Cl. 60-657.000.
Ostrelich, Michael J.: *See*—
Smith, Donald F.; and Ostrelich, Michael J., 4,191,444, Cl. 339-107.000.
Otomura, Satoshi: *See*—
Ema, Hideaki; Otomura, Satoshi; Imai, Chikara; and Sakai, Kiyoshi, 4,191,568, Cl. 430-66.000.
Ovnick, John L., Jr., to RCA Corporation. CATV block converter. 4,191,966, Cl. 358-86.000.
Owens-Corning Fiberglas Corporation: *See*—
Symborski, Alex P., 4,191,079, Cl. 83-347.000.
Owens-Illinois, Inc.: *See*—
Fortner, John M.; and Kirkman, Richard T., 4,191,548, Cl. 65-79.000.
Taylor, Lynn J.; and Tobias, John W., 4,191,320, Cl. 229-3.50R.
Packaging Corporation of America: *See*—
Hostad, Michael W., 4,191,288, Cl. 206-45.220.
Packham, Lester M. Propeller and impeller constructions. 4,191,506, Cl. 416-91.000.
Padco, Inc.: *See*—
Janssen, Robert I., 4,191,792, Cl. 427-260.000.
Page, Burford J.; and Westermann, Winfried N., to Westinghouse Electric Corp. Recessed interior fluorescent luminaire. 4,191,989, Cl. 362-220.000.
Palka, James J., to General Bathroom Products, Inc. Plastic hinge. 4,190,929, Cl. 16-169.000.
Palopoli, Frank P.: *See*—
Horgan, Stephen W.; Palopoli, Frank P.; and Wenstrup, David L., 4,191,828, Cl. 546-185.000.
Panduit Corp.: *See*—
Bulanda, John J.; and Lopata, John E., 4,191,334, Cl. 24-16.0PB.
Caveney, Jack E.; and Moody, Roy A., 4,191,442, Cl. 339-99.00R.
Panigati, Pier L., to Etablissement d'Occident. Fluid circuit or logic element. 4,191,203, Cl. 137-112.000.
Pannetier, Georges A.: *See*—
Briand, Marcel E.; and Pannetier, Georges A., 4,191,969, Cl. 358-145.000.
Parham, Thomas M., Jr.: *See*—
Hawkins, Edwin F.; and Parham, Thomas M., Jr., 4,191,550, Cl. 71-30.000.
Park-Ohio Industries, Inc.: *See*—
Shank, Robert J., 4,191,363, Cl. 266-129.000.
Parker, David G.; and Tompsett, Alan J., to Imperial Chemical Industries Limited. Manufacture of amines from alcohols with zeolite FU-1 catalysts. 4,191,709, Cl. 260-583.00R.
Parker-Hannifin Corporation: *See*—
Jelinek, Jerry G., 4,191,389, Cl. 277-166.000.
Pasco, Wayne D.; and Klug, Frederic J., to General Electric Company. Method for making porous, crushable core having an integral outer barrier layer. 4,191,720, Cl. 264-43.000.
Pasco, Wayne D.; Klug, Frederic J.; and Prochazka, Svante, to General Electric Company. Making ceramic articles having a high degree of porosity and crushability characteristics. 4,191,721, Cl. 264-43.000.
Passereau, Genevieve, to Instruments S.A. Spectrograph for an extended spectral field in which partial planar diffraction spectra are successively formed in the same plane. 4,191,474, Cl. 356-305.000.
Patel, Harshad H.; and Bose, Tejandra N., to Cummins Engine Company, Inc. Aftercooler assembly for internal combustion engine. 4,191,148, Cl. 123-119.0CD.
Patel, Jitendra G.; Schora, Frank C.; and Loeding, John W., to Institute of Gas Technology. Method for feeding caking coal particles to a gasifier. 4,191,539, Cl. 48-210.000.
Patel, Mahesh S., to Eutectic Corporation. Flame spray powder mix. 4,191,565, Cl. 75-252.000.
Patriquin, George P., to Hudson Lock, Inc. Cylinder lock with key responsive removable core. 4,191,037, Cl. 70-369.000.
Patton, Edward E., Jr. Bowler's glove and wrist support. 4,190,906, Cl. 2-161.00A.
Paul, Heinrich: *See*—
Krumphold, Ralf; Paul, Heinrich; Busalow, Juri; and Kopjew, Iwan, 4,191,597, Cl. 148-12.00B.
Paulos, Louis B.: *See*—
Huebsch, Donald L.; and Paulos, Louis B., 4,191,248, Cl. 166-65.00M.
Paulucci, Jeno F.: *See*—
Ahlgren, David W.; Hassell, David A.; and Zimmer, Elvis S., 4,191,881, Cl. 219-388.000.
Paulus, Philippe A.; and Economopoulos, Marios, to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie. Method of continuously heat-treating steel sheet or strip. 4,191,600, Cl. 148-142.000.
Paust, Joachim: *See*—
Grafen, Paul; Kroesche, Henning; Schulz, Bernhard; Paust, Joachim; and Pfohl, Sigberg, 4,191,692, Cl. 260-345.500.
Pawlowski, Edward J.: *See*—
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Pederson, Curtis O.: *See*—
Harrell, John B.; Barraclough, William F.; and Pederson, Curtis O., 4,191,529, Cl. 432-98.000.
Peel, Robert C.: *See*—
Headrick, J. Charles; Peel, Robert C.; and Starnes, R. Emory, 4,191,319, Cl. 228-147.000.
Pelton, John F., to Union Carbide Corporation. Threaded connections. 4,191,486, Cl. 403-28.000.
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Montgomery, Harry T.; and Nagati, Rashed N., 4,191,364, Cl. 266-246.000.
Pennzoil Company: *See*—
Drechsel, Erhart K.; and Sardisco, John B., 4,191,734, Cl. 423-320.000.

Penzel, Erich: *See*—
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Pepin, Christian: *See*—
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Beghi, Rene; Desmars, Gabriel; Monie, Yvan; and Pessayre, Raymond, 4,191,300, Cl. 212-41.000.
Peters, Max D. Sterile air recycling apparatus. 4,191,543, Cl. 55-279.000.
Peterson, Ronald S.: *See*—
Mittleman, John; Warrell, Charles O.; and Peterson, Ronald S., 4,191,461, Cl. 354-64.000.
Petri, Robert J.: *See*—
White, Hugh E.; and Petri, Robert J., 4,191,975, Cl. 358-264.000.
Pfahler, Gerhard: *See*—
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Pfizer, Inc.: *See*—
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Grafen, Paul; Kroesche, Henning; Schulz, Bernhard; Paust, Joachim; and Pfohl, Sigberg, 4,191,692, Cl. 260-345.500.
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Mather, Douglas E.; Messenger, Edward T.; and Phillips, Bryn M., 4,191,704, Cl. 260-459.00R.
Phillips, Charles M., Jr. Interrupter. 4,191,985, Cl. 361-56.000.
Phillips, David C.; and Garbuny, Max, to Westinghouse Electric Corp. Apparatus and method for producing stereo-regular polymers. 4,191,622, Cl. 204-159.220.
Phillips Petroleum Company: *See*—
Bjornson, Geir, 4,191,844, Cl. 568-805.000.
Cheng, Paul J., 4,191,542, Cl. 55-96.000.
Farha, Floyd, Jr.; and Drehman, Lewis E., 4,191,846, Cl. 585-440.000.
Kinney, Alfred W., 4,191,322, Cl. 229-5.800.
Stewart, William S.; and Hobbs, James W., 4,191,511, Cl. 417-18.000.
Swanson, Billy L., 4,191,657, Cl. 252-8.55C.
Uraneck, Carl A.; and Johnson, Paul H., 4,191,732, Cl. 423-243.000.
Piaggio & C. S.p.A.: *See*—
Doveri, Carlo, 4,191,156, Cl. 123-193.00C.
Pianka, Max, to Murphy Chemical Company Limited, The. 5-Chloromethyl diethylphosphorothiolothionate as a soil insecticide. 4,191,757, Cl. 424-225.000.
Pichl, Heinz, to AB Volvo Penta. Connecting rod or the like and method and mould for producing connecting rods or the like. 4,191,238, Cl. 164-100.000.
Pickard, John: *See*—
Fermi, Rudy; Pickard, John; Kocsis, Alex; Bratton, David; and Kasner, Gerald, 4,191,106, Cl. 101-415.100.
Picker Corporation: *See*—
Huang, Sung-Cheng; Brunnett, Carl J.; and Mattson, Rodney A., 4,191,892, Cl. 250-445.00T.
Pierce, Wendel D. Method for constructing a shrubbery shaper. 4,190,984, Cl. 47-58.000.
Piesinger, Gregory H., to Motorola Inc. Sampled data filter with time shared weighters for use as an LPC and synthesizer. 4,191,853, Cl. 179-1.05A.
Pinschmidt, Robert K., Jr.: *See*—
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Pioneer Electronic Corporation: *See*—
Inaba, Shizuo, 4,191,382, Cl. 274-15.00R.
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Pluss-Staufer AG: *See*—
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Poehler, Herbert. Device for extracting and positioning video tape from a cassette to around a slit head drum. 4,191,979, Cl. 360-85.000.
Pohlman, Joe C.; and Romualdi, James P. Liner construction. 4,190,993, Cl. 52-249.000.
Poklekowski, Helmut; Seeberger, Klaus; and Harmsma, Gunther, to Gewerkschaft Eisenhutte Westfalia. Mine roof supports. 4,191,497, Cl. 405-296.000.
Polaroid Corporation: *See*—
Bloom, Stanley M.; Borror, Alan L.; and Foley, James W., 4,191,689, Cl. 548-207.000.
Johnson, Bruce K., 4,191,462, Cl. 354-139.000.
Polcyn, Fabian C.; Marshall, Robert E.; and Nichols, H. Janney, to Environmental Research Institute of Michigan. Method and apparatus for analyzing microscopic specimens and the like. 4,191,940, Cl. 340-146.30B.
Pollard, Harry C., to National Research Development Corporation. Optical inspection. 4,191,476, Cl. 356-349.000.
Polychrome Corporation: *See*—
Herting, Hans-Peter; and Rebner, Wolfgang J., 4,191,570, Cl. 430-302.000.
Polysius AG: *See*—
Triebel, Wolfgang, 4,191,526, Cl. 432-58.000.
Pontano, Benjamin A.; and Chitre, NandKishore M., to Communications Satellite Corporation. Method and apparatus for interference cancellation at base-band using multiplication of the desired interfering carriers. 4,191,926, Cl. 325-476.000.
Popovich, Robert P.; Antwiler, Glen D.; and Moncrief, Jack W., to Hemotherapy Inc. Method and apparatus for continuous plasmapheresis. 4,191,182, Cl. 128-214.00R.
Powdrex Limited: *See*—
Dain, Richard J., 4,191,516, Cl. 425-7.000.
Powell, John M.; and Keeling, K. Bailey, Jr., to General Electric Company. Refrigerator compartment partitioning means. 4,191,434, Cl. 312-214.000.
PPG Industries, Inc.: *See*—
Wismer, Marco; and Bosso, Joseph F., 4,191,674, Cl. 260-29.2EP.
Pratt, Louis D.: *See*—
Sykes, Donald J.; and Pratt, Louis D., 4,191,575, Cl. 430-418.000.
Pravaz, Marcel H., to Cabinet Lavoix. Parachute having an improved multi-cell canopy. 4,191,349, Cl. 244-145.000.
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LeCaire, Robert A., Jr.; and Glashagel, Barry B., 4,191,307, Cl. 221-45.000.
Preston Engravers, Inc.: *See*—
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Prevorsek, Dusan C.: *See*—
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Primeau, John J. Draft hood and damper assembly for fuel fired heating apparatus. 4,191,171, Cl. 126-292.000.
Prior, Eric S. Upgrading waste paper by treatment with sulfite waste liquor. 4,191,610, Cl. 162-147.000.
Pro-tect, Inc.: *See*—
Wren, Fred H., Jr.; and Babcock, Frank H., III, 4,190,971, Cl. 36-106.000.
Prochazka, Svante: *See*—
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Procter & Gamble Company, The: *See*—
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Chabert, Pierre; and Foulletier, Louis, 4,191,666, Cl. 252-545.000.
Prosser, Dwight M. Window and sash balance. 4,190,930, Cl. 16-197.000.
Pullman Incorporated: *See*—
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Strahl, Victor H., 4,191,099, Cl. 98-60.000.
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PYE (Electronic Products) Limited: *See*—
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Quick, Leonard M.; and Hensley, Albert L., Jr., to Standard Oil Company (Indiana). Process for the cracking of heavy hydrocarbon streams. 4,191,635, Cl. 208-89.000.
Quinlan, Kenneth P.; and Hutta, Joseph J., to United States of America, Air Force. Method for the production of trialuminum nickelide fibers. 4,191,561, Cl. 75-101.00R.
Quinn, John E.; Wittenbrook, Lawrence S.; and Donegan, Charles E., to Betz Laboratories, Inc. Dewatering composition. 4,191,655, Cl. 252-60.000.
Rabin, Yehuda, to Dart Industries Inc. Universal planetary clamping device. 4,191,366, Cl. 269-47.000.
Rabner, Walter P. Stamp dispenser. 4,191,306, Cl. 221-33.000.
Raduchel, Bernd: *See*—
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Rafferty, Andrew J.: *See*—
Croy, David G.; Rafferty, Andrew J.; and Jolly, Richard D., 4,191,256, Cl. 166-343.000.
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Mallick, Pankaj K.; and Raghupathi, Narasimhan, 4,191,718, Cl. 264-26.000.
Rahikka, Veikko E. Thermic reactor. 4,191,132, Cl. 122-156.000.

Rahmstorf, Dietmar, to Messrs. BIG Spielwavenfabrik Dipl.-Ing. Ernst A. Bettag. Assemblable toy figure. 4,190,982, Cl. 46-161.000.
Ramey, Chester E.; and Luzzi, John J., to Ciba-Geigy Corporation. Hindered piperidine carboxylic acids, metal salts thereof and stabilized compositions. 4,191,682, Cl. 260-45.80N.
Ramey, Chester E.; and Luzzi, John J., to Ciba-Geigy Corporation. Hindered piperidine carboxylic acids and metal salts thereof. 4,191,829, Cl. 546-222.000.
Rampp, Egon; and Vogel, Alexander, to Siemens Aktiengesellschaft. Housing for a device, in particular for a printer. 4,191,433, Cl. 312-183.000.
Rank Organisation Limited, The: *See*—
Matchell, Raymond, 4,191,972, Cl. 358-214.000.
Ransburg Corporation: *See*—
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Rapidcircuit Corp.: *See*—
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Ray, Michel; and Nissoux, Jean L., to Etat Francais Represente par le Ministere de l'Environment et du Cadre de Vie Laboratorie Central des Ponts et Chaussees. Method for improving load transfers between concrete slabs in zones at which joints are provided, and means for performing same. 4,191,489, Cl. 404-51.000.
Raycon Corporation: *See*—
Check, John M.; and Rupert, Gary F., 4,191,878, Cl. 219-69.00E.
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RCA Corporation: *See*—
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Levine, Peter A.; and Sauer, Donald J., 4,191,895, Cl. 307-221.00D.
Naidus, Edward S., 4,190,987, Cl. 52-1.000.
Ovnick, John L., Jr., 4,191,966, Cl. 358-86.000.
Sauer, Donald J.; and Levine, Peter A., 4,191,896, Cl. 307-221.00D.
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Stave, Frederick R., 4,191,381, Cl. 274-9.00B.
Tams, Frederick J., III, 4,191,295, Cl. 211-41.000.
Van Renssen, Marinus, 4,190,936, Cl. 29-25.150.
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Reap, James J., to Du Pont de Nemours, E. I., and Company. Herbicidal sulfamates. 4,191,553, Cl. 71-92.000.
Rebner, Wolfgang J.: *See*—
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Redfern, Thomas P.; Connolly, Joseph J.; and Frederiksen, Thomas M., to National Semiconductor Corporation. Precision plural input voltage amplifier and comparator. 4,191,900, Cl. 307-355.000.
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Reed, James, R.; Way, Terrance; and Leal, Richard A., to General Motors Corporation. Apparatus for coating catalyst supports. 4,191,126, Cl. 118-50.000.
Reed, Samuel F.; and Pinschmidt, Robert K., Jr., to Rohm and Haas Company. Polymeric adsorbents from vinylbenzyl chloride copolymer beads. 4,191,813, Cl. 521-31.000.
Reeder, Thomas M.: *See*—
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Hong, Byung S.; Colles, Joseph H.; Scofield, David D.; Purdy, Stephen J.; and Reinsch, Stephen J., 4,191,456, Cl. 353-31.000.
Reitz, Richard J.; and Kruke, Edward J., to Bendix Corporation, The. Fluid pressure braking system having emergency valve. 4,191,429, Cl. 303-58.000.
Renda, Frank J. Hair dressing comb. 4,191,200, Cl. 132-123.000.
Rene, Ralph. Flame tip for soldering torch. 4,191,333, Cl. 239-543.000.
Renny, Arthur B. Art of exhibiting fish. 4,191,129, Cl. 119-5.000.
REPA Feinstanzwerk GmbH: *See*—
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Republic Steel Corporation: *See*—
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Reverberi, Leo. Folding garment. 4,190,905, Cl. 2-1.000.
Revitz, Martin: *See*—
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Rhee, Jhoon G. Protective device for the elbow, arm, palm and hand. 4,190,902, Cl. 2-16.000.
Ribka, Joachim: *See*—
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Richards, Lewis B.; and Romick, Kenneth R., to Washington Universal Security Products. Door locking assembly. 4,190,985, Cl. 49-16.000.
Richardson-Merrell Inc.: *See*—
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Ricoh Co., Ltd.: *See*—
Ema, Hideaki; Otomura, Satoshi; Imai, Chikara; and Sakai, Kiyoshi, 4,191,568, Cl. 430-66.000.
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Riethmann, Jean; Marti, Franz; and Somlo, Tibor, to Ciba-Geigy Aktiengesellschaft. Process for the production of substituted benzal and benzyl bromides. 4,191,621, Cl. 204-158.0HA.
Rim Jerusalem Furniture Limited: *See*—
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Rinelli, Giorgio; and Abbruzzese, Carlo, to Consiglio Nazionale della Ricerche. Hydrometallurgical process for separating lead and zinc from oxidized ore. 4,191,729, Cl. 423-98.000.
Ring, Stuart F.: *See*—
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Ringel, Samuel M.: *See*—
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Ritter, Arthur J., Jr., to Caterpillar Tractor Co. Drive assembly having an improved sun gear mounting. 4,191,073, Cl. 74-764.000.
Rivacoba, Jose U.; and Galdos, Alberto T., to Sener, Ingenieria y Sistemas S.A. Sea platforms to support industrial installations. 4,191,495, Cl. 405-195.000.
Rives, Allen K., to Lor, Inc. Method and apparatus for cutting and pulling tubular and associated well equipment submerged in a water covered area. 4,191,255, Cl. 166-297.000.
Robert Bosch GmbH: *See*—
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Robert, Jacques, to Commissariat a l'Energie Atomique. Method of control for an analog display device of the non-continuous liquid crystal strip type. 4,191,955, Cl. 340-753.000.
Roberto, Frederick J.: *See*—
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Molina, Orlando G., 4,191,048, Cl. 73-104.000.
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Rockwell-Rimoldi, S.p.A.: *See*—
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Rodgers, Milas M. Child safe latch. 4,191,411, Cl. 292-87.000.
Rodriguez, Federico A.; Becerra Novoa, Jorge; and Sanchez Ramirez, Julian, to Hylsa, S.A. Method for determining weight of molten metal in situ. 4,191,885, Cl. 250-302.000.
Rody, Jean: *See*—
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Roe, Frank L.: *See*—
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Roemer, Sidney: *See*—
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Rogers, Howard D., to Singer Company, The. Safety stopping device for a sewing machine. 4,191,122, Cl. 112-261.000.
Rogers, John W. Breakaway uncoiler. 4,191,318, Cl. 225-103.000.
Roger's Plating Limited: *See*—
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Rogoff, Gerald L., to Westinghouse Electric Corp. Compact single-ended fluorescent lamp having a partitioned envelope. 4,191,907, Cl. 313-204.000.

Rohm and Haas Company: *See—*
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Chong, Berni P., 4,191,812, Cl. 521-28.000.
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Roley, Robert D.; and Maguire, Roy L., to Caterpillar Tractor Co. Track-type vehicle undercarriage and link assembly. 4,191,431, Cl. 305-18.000.

Rolm Corporation: *See—*
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Romualdi, James P.: *See—*
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Rosinski, Edward J.: *See—*
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Rostomily, Clifford R. Severed-tree support device. 4,190,983, Cl. 47-40.500.

Roth, Albert B.; and Louie, Albert, to N L Industries, Inc. Pumping jack. 4,191,016, Cl. 60-371.000.

Roth, Dieter: *See—*
Wolf, Franz-Josef; and Roth, Dieter, 4,191,390, Cl. 277-219.000.

Rothblatt, Stephen H. Process for reducing metal oxides to metal. 4,191,556, Cl. 75-0.50B.

Rotocrop International, Ltd.: *See—*
Wilson, Clifford A., 4,191,337, Cl. 241-224.000.

Roussel Uclaf: *See—*
Jouquey, Alain; Raynaud, Jean-Pierre; and Salmon, Jean, 4,191,697, Cl. 260-397.500.

Rousset, Paul: *See—*
Stark, Virgil; Vayda, Alexandre; and Rousset, Paul, 4,191,594, Cl. 136-89.0PC.

Rovesti, William C.: *See—*
Lebowitz, Howard E.; Wolk, Ronald H.; Alpert, Seymour B.; Stewart, Norman C.; and Rovesti, William C., 4,191,700, Cl. 260-449.00M.

Rubel, Peter A.: *See—*
Rule, Clinton; and Rubel, Peter A., 4,191,240, Cl. 165-1.000.

Rubenstein, Kenneth E.: *See—*
Ullman, Edwin F.; and Rubenstein, Kenneth E., 4,191,613, Cl. 435-188.000.

Rubin, Jacob N.; and Seufert, Frederick B., to Stone & Webster Engineering Corporation. Process for converting unsaturated C_4 hydrocarbons into normal butane. 4,191,845, Cl. 585-253.000.

Rubin, Laurence A.; and Baker, William S., to Baxter Travenol Laboratories, Inc. Cover for rotatable sample tray. 4,191,234, Cl. 150-52.00R.

Ruegg, Robert J.; and Smith, Elliott P. Keyboard attachment system and method for keyboard training. 4,190,967, Cl. 35-6.000.

Rule, Clinton; and Rubel, Peter A. Heat conducting filler material for motor-containing devices. 4,191,240, Cl. 165-1.000.

Rupert, Gary F.: *See—*
Check, John M.; and Rupert, Gary F., 4,191,878, Cl. 219-69.00E.

Rushforth, Harold E. Golf tee awl and pivoted sheath. 4,190,955, Cl. 30-366.000.

Rushing, John C.; Smith, William E.; and King, Henry L. Apparatus for ultrasonically cleaning paper making felt. 4,191,611, Cl. 162-273.000.

Russell, Steven J.: *See—*
Williams, Malcolm; Tingey, Albert R.; Southgate, John P.; and Russell, Steven J., 4,191,137, Cl. 123-32.0EH.

Ryan, James W., to University of Miami. Anti-hypertensive peptide analogs. 4,191,753, Cl. 424-177.000.

Ryder, William C.; and Hobbs, John C., to Ford Motor Company. Circuit board assembly. 4,191,441, Cl. 339-17.00F.

Ryobi, Ltd.: *See—*
Morishita, Yasomatsu, 4,191,343, Cl. 242-84.21R.

Saarem, Myrl J.; Lovelace, Donald E.; Firebaugh, Dale C.; and Soukup, Dale F., to Richdel, Inc. Solar heat system. 4,191,166, Cl. 126-430.000.

Sabins Industries, Inc.: *See—*
Sabins, Rolland C., 4,191,625, Cl. 204-197.000.

Sabins, Rolland C., to Sabins Industries, Inc. Aluminum marine anode assembly with low resistance surface mountings. 4,191,625, Cl. 204-197.000.

Sabon, Robert J., to GTE Automatic Electric Laboratories Incorporated. Loop, dial pulse and ring trip detection circuit with capacitive shunt network. 4,191,859, Cl. 179-18.0FA.

Safonov, Anatoly V.: *See—*
Grigorenko, Anatoly S.; Moroz, Jury A.; Kortusov, Leonid I.; Bocharov, Jury A.; and Safonov, Anatoly V., 4,191,044, Cl. 72-354.000.

Sageman, David R.: *See—*
Mitchell, David S.; and Sageman, David R., 4,191,540, Cl. 48-197.00R.

Saigusa, Tetsuji: *See—*
Kadono, Mamoru; Saigusa, Tetsuji; Nakajima, Yoshiyuki; and Koga, Tomohiro, 4,191,217, Cl. 138-109.000.

Saito, Takeo; Seki, Youichi; and Kitai, Kiyoshi, to Seiko Koki Kabushiki Kaisha. Digital camera shutter control circuit having memory read-out/shutter opening synchronization. 4,191,459, Cl. 354-23.00D.

Saitoh, Shigeru; and Suzuki, Noboru, to Kureha Kagaku Kogyo Kabushiki Kaisha. Furnace adapted for burning city-, industrial and the like wastes. 4,191,114, Cl. 110-248.000.

Sakai, Hisao, to Hitachi, Ltd. Full duplex audio response device. 4,191,855, Cl. 179-2.00A.

Sakai, Kiyoshi: *See—*
Ema, Hideaki; Otomura, Satoshi; Imai, Chikara; and Sakai, Kiyoshi, 4,191,568, Cl. 430-66.000.

Sakakibara, Naoji: *See—*
Kawata, Shoji; and Sakakibara, Naoji, 4,191,051, Cl. 73-347.000.

Sakakibara, Shumpei: *See—*
Nagatsu, Toshiharu; and Sakakibara, Shumpei, 4,191,808, Cl. 435-24.000.
Nagatsu, Toshiharu; and Sakakibara, Shumpei, 4,191,809, Cl. 435-24.000.

Sakharoff, Albert. Roof flashing system. 4,190,989, Cl. 52-60.000.

Sakumoto, Hideki: *See—*
Furumoto, Mitsunobu; Yano, Osahiko; Kikuya, Satoshi; Kubo, Kanji; and Sakumoto, Hideki, 4,191,978, Cl. 360-75.000.

Sakurada, Nobuaki: *See—*
Kawamura, Masaharu; Sakurada, Nobuaki; Shinoda, Nobuhiko; Ito, Fumio; Murakami, Hiroyashu; and Ito, Tadashi, 4,191,458, Cl. 354-23.00D.

Salem Furnace Co.: *See—*
Harrell, John B.; Barraclough, William F.; and Pederson, Curtis O., 4,191,529, Cl. 432-98.000.

Sallman, Charles M., to N L Industries, Inc. Aspiration circulation system and method. 4,191,525, Cl. 432-21.000.

Salmon, Jean: *See—*
Jouquey, Alain; Raynaud, Jean-Pierre; and Salmon, Jean, 4,191,697, Cl. 260-397.500.

Salome, Frederik; and Elliott, William T., to Berger Jenson & Nicholson Ltd.; and Berger Jenson & Nicholson Ltd. Polymer aggregates. 4,191,672, Cl. 260-29.6PM.

Salomon, Georges P. J., to Etablissements Francois Salomon et Fils. Ski boot element. 4,191,395, Cl. 280-613.000.

Salter, Lowell S., Jr., to Morgan Construction Company. Heavy duty axial adjustment mechanism for rolling mill rolls. 4,191,042, Cl. 72-247.000.

Sample, Larry E. Drip irrigation system for agriculture. 4,191,330, Cl. 239-66.000.

Samsing, Rolf A. Container having paper-board end cap and oval sleeve. 4,191,321, Cl. 229-5.500.

Samuel Moore and Company: *See—*
Houk, Richard D.; and Jones, Marvin H., 4,191,064, Cl. 74-475.000.

Samuels, Michael W.: *See—*
Zasio, John J.; and Samuels, Michael W., 4,191,916, Cl. 318-640.000.

Samurin, Norman A.; and Straslicka, William A., to Carrier Corporation. Apparatus for securing a wheel to a rotatable shaft of a turbomachine. 4,191,485, Cl. 403-15.000.

Sanchez Ramirez, Julian: *See—*
Rodriguez, Federico A.; Becerra Novoa, Jorge; and Sanchez Ramirez, Julian, 4,191,885, Cl. 250-302.000.

Sanchioni, Sergio: *See—*
Neri, Amleto; Sanchioni, Sergio; and Nava, Carlo, 4,191,695, Cl. 260-346.760.

Sandelman, David: *See—*
Isaacs, Roger H.; Sandelman, David; and Shprecher, Daniel E., 4,191,328, Cl. 236-46.00R.

Sanders Associates, Inc.: *See—*
Kuppenheimer, John D., 4,191,931, Cl. 331-94.50Q.

Sando Iron Works, Co. Ltd.: *See—*
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,190,966, Cl. 34-242.000.

Sando, Yoshikazu; and Ishidoshiro, Hiroshi, to Sando Iron Works, Co. Ltd. Wiping and drying device for an inlet seal rolls on a high pressure steamer. 4,190,966, Cl. 34-242.000.

Sandoz, Inc.: *See—*
Nadelson, Jeffrey, 4,191,827, Cl. 546-116.000.

Sandoz Ltd.: *See—*
Gross, Rolf; and Fricker, Rene, 4,191,532, Cl. 8-21.00A.

Sankyo Company Limited: *See—*
Brunetti, Heimo; Rody, Jean; Soma, Nobuo; and Kurumada, Tomoyuki, 4,191,683, Cl. 260-45.80N.

Sardisco, John B.: *See—*
Drechsel, Erhart K.; and Sardisco, John B., 4,191,734, Cl. 423-320.000.

Sarem, Amir M., to Union Oil Company of California. Reducing the relative water/petroleum movement in a petroleum producing reservoir. 4,191,249, Cl. 166-244.00C.

Sasaki, Shin: *See—*
Tsukidate, Yoshitaka; and Sasaki, Shin, 4,191,984, Cl. 360-132.000.

Sasso, Luigi. Multi-speed gear transmission especially for use in warping machines. 4,191,069, Cl. 74-681.000.

Sato, Hideharu, to Nihon Beru-Haueru Kabushiki Kaisha (Bell & Howell Japan, Ltd.). Automatic focus adjusting device. 4,191,882, Cl. 250-201.000.

Sato, Katsutoshi; Ito, Susumu; Kanaya, Tadashi; Onishi, Hiroaki; Ichiishi, Tsuneo; and Osaka, Akira, to Hitachi, Ltd. Apparatus for transporting cylindrical steel articles. 4,191,286, Cl. 193-40.000.

Sato, Kyoshi: *See*—
Nakajima, Kunihiko; Sato, Kyoshi; Iio, Toshimitsu; and Kanda, Atsushi, 4,191,866, Cl. 200-4.000.

Sato, Mituharu; and Yamazaki, Katsuo, to Toshiba Kikai Kabushiki Kaisha. Automatic tool exchanging apparatus of machine tool. 4,190,947, Cl. 29-568.000.

Sato, Shui: *See*—
Endo, Takaya; Sato, Shui; Kikuchi, Shoji; Kozima, Tamotsu; Usui, Tugumoto; Imamura, Hiroyuki; and Takabe, Koichi, 4,191,574, Cl. 430-387.000.

Sato, Takami: *See*—
Kojimoto, Susumu; Sato, Takami; and Mori, Toshio, 4,191,518, Cl. 425-326.100.

Sato, Takateru; and Shoji, Shigemasa, to TDK Electronics Company, Limited. Tape cassette. 4,191,345, Cl. 242-197.000.

Satou, Masami: *See*—
Okita, Tsutomu; Satou, Masami; Hibino, Noburo; Katoh, Kazunobu; and Sugiyama, Masatoshi, 4,191,679, Cl. 260-40.00R.

Saucy, Gabriel: *See*—
Cohen, Noal; and Saucy, Gabriel, 4,191,842, Cl. 568-662.000.

Sauer, Donald J.; and Levine, Peter A., to RCA Corporation. Low noise CCD input circuit. 4,191,896, Cl. 307-221.00D.

Sauer, Donald J.: *See*—
Levine, Peter A.; and Sauer, Donald J., 4,191,895, Cl. 307-221.00D.

Schaffer, Ezra. Metal duct drive bending tool. 4,191,043, Cl. 72-319.000.

Schara, Robert E.; Keenberg, Larry E.; and Makar, Andrew, to General Foods Corporation. Pet food flavor. 4,191,781, Cl. 426-2.000.

Scheepvaartbedrijf "Con Brio" N.V.: *See*—
van der Laan, Berend, 4,191,124, Cl. 114-123.000.

Scheicher, Hans. Corrective agent for the covering and/or filling of bone defects, method for the preparation of same and method of using the same. 4,191,747, Cl. 424-94.000.

Schelisch, Ernst F., to Marconi Company Limited, The. Satellite communication systems. 4,191,923, Cl. 325-4.000.

Schering Aktiengesellschaft: *See*—
Skuballa, Werner; Raduchel, Bernd; Schwarz, Norbert; Vorbrueggen, Helmut; Muller, Bernd; Mannesmann, Gerda; Loge, Olaf; Schillinger, Ekkehardt; and Casals-Stenzel, Jorge, 4,191,694, Cl. 260-346.220.
Skuballa, Werner; Raduchel, Bernd; and Vorbrueggen, Helmut, 4,191,823, Cl. 542-426.000.

Schick, Dieter, to Ernst Leitz Wetzlar GmbH. Process and apparatus for the separate evaluation of image contents in two coordinate directions of motion. 4,191,477, Cl. 356-373.000.

Schieck, Richard A., to Xerox Corporation. Dual mode catch tray. 4,191,467, Cl. 355-75.000.

Schiedat, Heinz, to Stiebel Eltron GmbH & Co. KG. Pressure tank for hot-water heaters. 4,191,304, Cl. 220-414.000.

Schiel, Christian, to J. M. Voith GmbH. Web drying section for paper machine. 4,190,964, Cl. 34-114.000.

Schiller, August; Louis, Eckhart; Bosch, Erhard; and Braunsperger, Karl, to Wacker-Chemie GmbH. Curable compositions and elastomers prepared therefrom. 4,191,817, Cl. 528-38.000.

Schillig, Henning: *See*—
Flossdorf, Josef; Schillig, Henning; and Schindler, Klaus-Peter, 4,191,469, Cl. 356-23.000.

Schillinger, Ekkehardt: *See*—
Skuballa, Werner; Raduchel, Bernd; Schwarz, Norbert; Vorbruggen, Helmut; Muller, Bernd; Mannesmann, Gerda; Loge, Olaf; Schillinger, Ekkehardt; and Casals-Stenzel, Jorge, 4,191,694, Cl. 260-346.220.

Schindler, Klaus-Peter: *See*—
Flossdorf, Josef; Schillig, Henning; and Schindler, Klaus-Peter, 4,191,469, Cl. 356-23.000.

Schindler, Rudolf; and Hartmann, Werner, to Messerschmitt-Bolkow-Blohm GmbH. Corners of structural members. 4,190,996, Cl. 52-309.130.

Schirmer, Klaus, to Knorr-Bremse GmbH. Anti-lock device for railway vehicles. 4,191,430, Cl. 303-109.000.

Schlumberger Technology Corporation: *See*—
Bosse-Platiere, Michel J., 4,191,265, Cl. 175-4.560.

Schmelzer Corporation: *See*—
Benjamin, Benjamin C., 4,191,096, Cl. 92-143.000.

Schmidt, Pierre E.; and Das, Mukunda B., to Instituto Venezolano de Investigaciones Cientificas (IVIC). Built-in notched channel MOSFET triodes for high frequency application. 4,191,963, Cl. 357-23.000.

Schmidt, Robert D. Snow blower deflector shield. 4,190,973, Cl. 37-43.00R.

Schmidt, Robert D.: *See*—
James, Reginald S.; Grier, Thomas M.; and Schmidt, Robert D., 4,190,961, Cl. 33-180.00R.

Schnabel, Georg: *See*—
Bender, Hans; Schnabel, Georg; Duren, Gottfried; and Zabel, Wolf, 4,191,591, Cl. 134-25.00R.

Schneider, Kurt: *See*—
Meyer, Rolf-Volker; Dhein, Rolf; Schneider, Kurt; and Fahnler, Friedrich, 4,191,819, Cl. 528-315.000.

Schoeps, Knut C., to Atlas Copco Aktiebolag. Device for tightening a screw joint. 4,191,282, Cl. 192-0.034.

Schora, Frank C.: *See*—
Patel, Jitendra G.; Schora, Frank C.; and Loeding, John W., 4,191,539, Cl. 48-210.000.

Schramm, Eugene C., to Bell Telephone Laboratories, Incorporated. Electrical connector for coupling power leads to circuit boards. 4,191,440, Cl. 339-17.00C.

Schreckenberg, Manfred: *See*—
Lindner, Christian; Suling, Carlhans; Bartl, Herbert; Schreckenberg, Manfred; Freitag, Dieter; and Konig, Klaus, 4,191,705, Cl. 260-463.000.

Schreiber, Joachim G. M.: *See*—
Schreiber, Peter J.; and Schreiber, Joachim G. M., 4,191,952, Cl. 340-611.000.

Schreiber, Peter J.; and Schreiber, Joachim G. M., to N.A.D., Inc. Low oxygen flow alarm for anesthesia systems. 4,191,952, Cl. 340-611.000.

Schreiber, William L.; Siano, James N.; Vock, Manfred H.; and Shuster, Edward J., to International Flavors & Fragrances Inc. Organoleptic uses of 1-(3,3-dimethyl-2-norbornyl)-2-propanone in cationic, anionic and nonionic detergents and soaps. 4,191,660, Cl. 252-174.110.

Schroeder, Melvin J.: *See*—
Wilcox, Brian N.; Schroeder, Melvin J.; Whittington, Billy J.; and Robinson, John W., 4,191,083, Cl. 84-1.280.

Schroter, Wolfgang: *See*—
Nickl, Josef; Muller, Erich; Narr, Berthold; Haarmann, Walter; Schroter, Wolfgang; and Kadatz, Rudolf, 4,191,776, Cl. 424-308.000.

Schubert, Heinz: *See*—
Muldery, Hendrikus; and Schubert, Heinz, 4,191,521, Cl. 425-432.000.

Schulte, Klaus: *See*—
Boggum, Paul; and Schulte, Klaus, 4,191,528, Cl. 432-248.000.

Schultenkamper, Josef, to Gelenkwellenbau GmbH. Transmission shaft indexing coupling. 4,191,487, Cl. 403-337.000.

Schulz, Bernhard: *See*—
Grafen, Paul; Kroesche, Henning; Schulz, Bernhard; Paust, Joachim; and Pfohl, Sigberg, 4,191,692, Cl. 260-345.500.

Schulze, Heinz, to Veb Pentacon Dresden Kamera und Kinowerke. Blade type focal plane shutters. 4,191,464, Cl. 354-246.000.

Schulze, Martin; and Preusser, Gerhard, to Krupp-Koppers GmbH. Process for operating extraction or extractive distillation apparatus. 4,191,615, Cl. 203-3.000.

Schumacher, Frederick G.; and Yllo, Walter, to Du Pont de Nemours, E. I., and Company. Highly filled thermoplastic compositions based on ethylene interpolymers and processing oils. 4,191,798, Cl. 428-95.000.

Schuplin, Jerome T., to Fastway Fasteners, Inc. Rotatably installed suspension clip. 4,191,352, Cl. 248-317.000.

Schwarz, Hans-Helmut: *See*—
Lenthe, Manfred; and Schwarz, Hans-Helmut, 4,191,711, Cl. 260-650.00R.

Schwarz, Norbert: *See*—
Skuballa, Werner; Raduchel, Bernd; Schwarz, Norbert; Vorbruggen, Helmut; Muller, Bernd; Mannesmann, Gerda; Loge, Olaf; Schillinger, Ekkehardt; and Casals-Stenzel, Jorge, 4,191,694, Cl. 260-346.220.

Schwee, Leonard J.; Anderson, Wallace E.; Liu, Yuan-Jye; and Lee, Ronald N., to United States of America, Navy. Crosstie memory bit stretcher detector. 4,192,012, Cl. 365-87.000.

Schweizer, Eduard H. Container for interchangeable tape cassette. 4,191,292, Cl. 206-387.000.

Schwing, Friedrich, to Friedrich Wilhelm Schwing GmbH. Pump for conveying cement. 4,191,513, Cl. 417-517.000.

SCM Corporation: *See*—
Mueller, Hans W., 4,191,483, Cl. 400-369.000.

Scofield, David D.: *See*—
Hong, Byung S.; Colles, Joseph H.; Scofield, David D.; Purdy, Stephen J.; and Reinsch, Stephen J., 4,191,456, Cl. 353-31.000.

Scott, Hubert D., to Texaco Inc. Determination of water saturation in subsurface earth formations adjacent well boreholes. 4,191,884, Cl. 250-270.000.

Scripps Clinic and Research Foundation: *See*—
Katz, David H., 4,191,668, Cl. 260-6.000.

Scully, John F., to American Optical Corporation. Range finding fiberscope. 4,191,468, Cl. 356-17.000.

Securiweb Limited: *See*—
Wildi, Leo J., 4,190,934, Cl. 24-77.00R.

Seeberger, Klaus: *See*—
Poklekowski, Helmut; Seeberger, Klaus; and Harmsma, Gunther, 4,191,497, Cl. 405-296.000.

Seifried, Paul E.: *See*—
McGrath, James W., Jr.; and Seifried, Paul E., 4,191,294, Cl. 209-135.000.

Seiko Koki Kabushiki Kaisha: *See*—
Saito, Takeo; Seki, Youichi; and Kitai, Kiyoshi, 4,191,459, Cl. 354-23.00D.

Seki, Youichi: *See*—
Saito, Takeo; Seki, Youichi; and Kitai, Kiyoshi, 4,191,459, Cl. 354-23.00D.

Sellstedt, John H.; Guinosso, Charles J.; and Begany, Albert J., to American Home Products Corporation. Oxamic acid derivatives. 4,191,840, Cl. 562-453.000.

Semasa, Takayoshi: *See*—
Ono, Fumitaka; Semasa, Takayoshi; Ueno, Yutaka; and Iwata, Shuzi, 4,191,974, Cl. 358-261.000.

Sener, Ingenieria y Sistemas S.A.: *See*—
Rivacoba, Jose U.; and Galdos, Alberto T., 4,191,495, Cl. 405-195.000.
Seo, Iwao, to Mitsubishi Petrochemical Co. Ltd. Catheter head-type transducer. 4,191,193, Cl. 128-675.000.
Sessa, Terenzio. Car side window lifting mechanism. 4,191,060, Cl. 74-89.220.
Seufert, Frederick B.: *See*—
Rubin, Jacob N.; and Seufert, Frederick B., 4,191,845, Cl. 585-253.000.
Shackle, Dale R.: *See*—
Lee, Yu-Sun; and Shackle, Dale R., 4,191,404, Cl. 282-27.500.
Shank, Robert J., to Park-Ohio Industries, Inc. Quenching device for inductively heated workpieces. 4,191,363, Cl. 266-129.000.
Shannon, Francis T.: *See*—
Dixon, Robert P.; and Shannon, Francis T., 4,191,925, Cl. 325-474.000.
Sharp Kabushiki Kaisha: *See*—
Tanada, Eiji, 4,191,850, Cl. 179-1.0GD.
Shaw, David L. Magneto drive adapter. 4,191,157, Cl. 123-198.00R.
Shay, Joseph L.: *See*—
Beni, Gerardo; Gottesfeld, Shimshon; McIntyre, James D. E.; and Shay, Joseph L., 4,191,453, Cl. 350-357.000.
Shell Oil Company: *See*—
Grisham, William P., Jr., 4,191,631, Cl. 208-33.000.
Kwantes, Arien; and Gautier, Pieter A., 4,191,843, Cl. 568-728.000.
Shemtov, Sami. Multicompartment condiment and spice dispenser. 4,191,312, Cl. 222-142.900.
Shen, Ming-shing: *See*—
Yang, Ralph T.; and Shen, Ming-shing, 4,191,115, Cl. 110-347.000.
Shepard, Joseph F.: *See*—
Garbarino, Paul L.; Revitz, Martin; and Shepard, Joseph F., 4,191,603, Cl. 148-187.000.
Sherman, William E. Chain saw bar guide alignment system. 4,191,074, Cl. 76-25.00R.
Sherrill, Charles F.: *See*—
Brown, Wayne R.; Jones, John E.; and Sherrill, Charles F., 4,191,917, Cl. 320-2.000.
Sheterom, Samuel G., Jr.: *See*—
Speiser, Arthur S.; and Sheterom, Samuel G., Jr., 4,191,367, Cl. 269-203.000.
Shibata Kogyo Co., Ltd: *See*—
Nakamura, Koji; Ogata, Masaru; and Nakatsuka, Takuzo, 4,191,494, Cl. 405-171.000.
Shibata, Norio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Evaporated fuel vapor control device for use in an internal combustion engine. 4,191,154, Cl. 123-136.000.
Shillingford, John T., Jr.: *See*—
Bowditch, Philip N.; Dahlen, John M.; McKenna, John F., Jr.; Shillingford, John T., Jr.; Siraco, Frank J.; and Toth, William E., 4,191,049, Cl. 73-170.00A.
Shin-Shirasuna Electric Corporation: *See*—
Nishikawa, Masao, 4,191,852, Cl. 179-1.00G.
Shinn, Robert W.: *See*—
Lyons, James E.; Shinn, Robert W.; and Suld, George, 4,191,839, Cl. 560-241.000.
Shinoda, Nobuhiko: *See*—
Kawamura, Masaharu; Sakurada, Nobuaki; Shinoda, Nobuhiko; Ito, Fumio; Murakami, Hiroyashu; and Ito, Tadashi, 4,191,458, Cl. 354-23.00D.
Shinomiya, Shigeo: *See*—
Nagashima, Tomoyuki; Tanaka, Masayuki; and Shinomiya, Shigeo, 4,191,269, Cl. 180-27.000.
Shirland, Fred A.; and Biter, William J., to Westinghouse Electric Corp. Integrated solar cell array. 4,191,794, Cl. 427-74.000.
Shiroto, Yoshimi: *See*—
Fukui, Yoshio; Shiroto, Yoshimi; Ando, Mamoru; and Homma, Yasumasa, 4,191,636, Cl. 208-110.000.
Shoji, Shigemasa: *See*—
Sato, Takateru; and Shoji, Shigemasa, 4,191,345, Cl. 242-197.000.
Shprecher, Daniel E.: *See*—
Isaacs, Roger H.; Sandelman, David; and Shprecher, Daniel E., 4,191,328, Cl. 236-46.00R.
Shuck, William D.; Lind, Frederick D.; and Cole, John W., to Tousley-Bixler Construction Co. Inc. Sludge agitating apparatus. 4,191,479, Cl. 366-101.000.
Shuster, Edward J.: *See*—
Schreiber, William L.; Siano, James N.; Vock, Manfred H.; and Shuster, Edward J., 4,191,660, Cl. 252-174.110.
Siano, James N.: *See*—
Schreiber, William L.; Siano, James N.; Vock, Manfred H.; and Shuster, Edward J., 4,191,660, Cl. 252-174.110.
Sidorenko, Valery A.: *See*—
Morgunsky, Evgeny I.; Sidorenko, Valery A.; and Plotnikov, Vladmir A., 4,191,075, Cl. 82-36.00R.
Siemens Aktiengesellschaft: *See*—
Amtmann, Heribert; Ebersberger, Hans; Eckardt, Guenter; and Greiner, Hans-Joachim, 4,191,891, Cl. 250-402.000.
Franetzki, Manfred; Prestele, Karl; and Funke, Helmut, 4,191,181, Cl. 128-213.00R.
Kratz, Gerhard; and Kuehnel, Werner, 4,191,993, Cl. 363-135.000.
Kratz, Gerhard; and Kuehnel, Werner, 4,191,994, Cl. 363-135.000.
Mayer, Max, 4,191,847, Cl. 178-3.000.
Rampp, Egon; and Vogel, Alexander, 4,191,433, Cl. 312-183.000.
Siewert, Robert M., to General Motors Corporation. Engine with selective venting of unburned mixture from the piston crevice volume. 4,191,150, Cl. 123-119.00B.
Sih, John C.: *See*—
Johnson, Roy A.; and Sih, John C., 4,191,822, Cl. 542-416.000.
Silence, William L., to Cabot Corporation. Wear-resistant nickel-base alloy. 4,191,562, Cl. 75-122.000.
Siler, Todd L. Artists' canvas and frame assembly. 4,190,974, Cl. 38-102.900.
Simms, Donald S. Energy saving air-flow heater. 4,191,162, Cl. 126-123.000.
Simplimatic Engineering Company: *See*—
Vinoskey, Adam V., 4,191,005, Cl. 53-382.000.
Singer Company, The: *See*—
Rogers, Howard D., 4,191,122, Cl. 112-261.000.
Singer, Monroe J. Toy sleigh. 4,190.979, Cl. 46-17.000.
Sinklier, Robert W.; and Venditto, Virgil A., Jr., to National Optronics, Incorporated. Plastic lens cutter and edger. 4,191,501, Cl. 409-104.000.
Siraco, Frank J.: *See*—
Bowditch, Philip N.; Dahlen, John M.; McKenna, John F., Jr.; Shillingford, John T., Jr.; Siraco, Frank J.; and Toth, William E., 4,191,049, Cl. 73-170.00A.
Sisenca S.A.: *See*—
Ohlsson, Jarl E. S. I., 4,191,105, Cl. 101-415.100.
Sisk, Francis J.; and Veyo, Stephen E., to Electric Power Research Institute, Inc. Fuel fired supplementary heater for heat pump. 4,191,023, Cl. 62-79.000.
Sisk, Francis J., to Electric Power Research Institute, Inc. Apparatus for defrosting low temperature heat exchanger. 4,191,026, Cl. 62-140.000.
Skaadel, Johannes; and Omdal, Bjarne, to Norsk Hydro A.S. Flexible container for transportation and storage of bulk materials. 4,191,229, Cl. 150-1.000.
Skelton, John: *See*—
Clark, Richard E.; Skelton, John; and Davis, Robert B., 4,191,218, Cl. 139-383.00R.
Skoli, Sigmund P.: *See*—
Mojonnier, Harry G.; and Skoli, Sigmund P., 4,191,784, Cl. 426-475.000.
Skotheim, Terje A., to United States of America, Energy. Dye-sensitized solar cells. 4,190,950, Cl. 29-572.000.
Skuballa, Werner; Raduchel, Bernd; Schwarz, Norbert; Vorbruggen, Helmut; Muller, Bernd; Mannesmann, Gerda; Loge, Olaf; Schillinger, Ekkehardt; and Casals-Stenzel, Jorge, to Schering Aktiengesellschaft. Prostaglandin-I_2 derivatives. 4,191,694, Cl. 260-346.220.
Skuballa, Werner; Raduchel, Bernd; and Vorbrueggen, Helmut, to Schering Aktiengesellschaft. Process for the preparation of oxaprostaglandin intermediates. 4,191,823, Cl. 542-426.000.
Slater Electric Inc.: *See*—
Doyle, Richard C., 4,191,443, Cl. 339-103.00R.
Small, James R.: *See*—
Katterheinrich, Fred H.; and Small, James R., 4,191,605, Cl. 156-285.000.
Smartt, Herschel B.; and Kovacs, Bela V., to Ford Motor Company. Continuous stream treatment of ductile iron. 4,191,563, Cl. 75-130.00R.
Smith, Archie O. Apparatus for harvesting okra or the like. 4,191,008, Cl. 56-327.00R.
Smith, Clive P., to Imperial Chemical Industries Limited. Fire retardant polyester-polytetrafluoroethylene compositions. 4,191,678, Cl. 260-40.00R.
Smith, Donald F.; and Ostrelich, Michael J., to General Electric Company. Dead front plug with strain relief. 4,191,444, Cl. 339-107.000.
Smith, Edward J., to REPA Feinstanzwerk GmbH. Swiveling anchor for occupant restraint system. 4,191,400, Cl. 280-808.000.
Smith, Elliott P.: *See*—
Ruegg, Robert J.; and Smith, Elliott P., 4,190,967, Cl. 35-6.000.
Smith Kline & French Laboratories Limited: *See*—
Durant, Graham J.; Ganellin, Charon R.; and Young, Rodney C., 4,191,769, Cl. 424-263.000.
Smith, Randlow: *See*—
Chess, David D.; Helbling, Clements A., Jr.; and Smith, Randlow, 4,191,640, Cl. 208-348.000.
Smith, William E.: *See*—
Rushing, John C.; Smith, William E.; and King, Henry L., 4,191,611, Cl. 162-273.000.
Snaddon, Michael B. Raise-boring. 4,191,267, Cl. 175-53.000.
Snamprogetti, S.p.A.: *See*—
Arrigoni, Virgilio; Ercolani, Dario; and Ferrini, Francesco, 4,191,047, Cl. 73-61.400.
Snook, Edward H.: *See*—
Fox, Stephen N. W.; Snook, Edward H.; and Stimson, Norman F., deceased, 4,191,271, Cl. 180-77.0TC.
Sobierajski, Isabelle M.: *See*—
Buescher, William E.; Roberto, Frederick J.; and Sobierajski, Isabelle M., 4,191,577, Cl. 106-1.120.
Societe Anonyme dite: Etablissements Georges Olivier: *See*—
Varin, Michel A., 4,190,923, Cl. 15-383.000.
s.a. PRB: *See*—
Jourquin, Lucien; and Du Prez, Eddie, 4,191,815, Cl. 521-51.000.
s.a. Texaco Belgium n.v.: *See*—
Hermans, Johny C., 4,191,826, Cl. 544-337.000.
Societe Chimique des Charbonnages - CdF Chimie: *See*—
Gloriod, Pierre, 4,191,821, Cl. 528-501.000.

Societe Francaise Hoechst: *See*—
Soreau, Michel; and Christidis, Yani, 4,191,841, Cl. 562-475.000.
Societe Industrielle de Brevets et d'Etudes S.I.B.E.: *See*—
Dutta, Rathindra; Rosgen, Josef; and Rosemann, Gerd, 4,191,149, Cl. 123-119.0EC.
Societe Nationale des Poudres et Explosifs: *See*—
Tillac, Jean-Francois, 4,191,344, Cl. 242-107.000.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation (S.N.E.C.M.A.): *See*—
Teysseyre, Pierre M.; and Baudier, Claude P., 4,191,510, Cl. 416-230.000.
Solar Heat Corporation: *See*—
Hyman, Mark, 4,191,169, Cl. 126-444.000.
Solartech Systems Corporation: *See*—
Geaslin, William E., 4,191,329, Cl. 126-427.000.
Solid Photography Inc.: *See*—
DiMatteo, Paul L.; and Diaferia, Henry V., 4,190,913, Cl. 5-81.00R.
Solie, Leland P., to Sperry Corporation. High efficiency wide band surface acoustic wave coupler processors. 4,191,934, Cl. 333-155.000.
Soma, Nobuo: *See*—
Brunetti, Heimo; Rody, Jean; Soma, Nobuo; and Kurumada, Tomoyuki, 4,191,683, Cl. 260-45.80N.
Somlo, Tibor: *See*—
Riethmann, Jean; Marti, Franz; and Somlo, Tibor, 4,191,621, Cl. 204-158.0HA.
Sommer, Werner, to Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co. KG. Rocker arm construction for knitting machine needle. 4,191,033, Cl. 66-64.000.
Sonitronics, Inc.: *See*—
Feaster, Donavon L., 4,191,867, Cl. 200-16.00R.
Sony Corporation: *See*—
Matsuda, Atsushi; and Kishigami, Jun, 4,191,863, Cl. 179-115.50R.
Tsukidate, Yoshitaka; and Sasaki, Shin, 4,191,984, Cl. 360-132.000.
Sopher, Joshua E., to American Hospital Supply Corporation. Method and apparatus for measuring attack and release times of hearing aids. 4,191,864, Cl. 179-175.10A.
Soreau, Michel; and Christidis, Yani, to Societe Francaise Hoechst. Process for manufacturing 4-hydroxy-3,5-dimethoxy benzoic acid from 3,4,5-trimethoxybenzoic acid. 4,191,841, Cl. 562-475.000.
Sorenson, Richard W., to Carlingswitch, Inc. Switch case with stackable lock washer. 4,191,872, Cl. 200-296.000.
Sorlien, Charles J. Light shield for mast-mounted navigation lights. 4,191,991, Cl. 362-319.000.
Soukup, Dale F.: *See*—
Saarem, Myrl J.; Lovelace, Donald E.; Firebaugh, Dale C.; and Soukup, Dale F., 4,191,166, Cl. 126-430.000.
Sourrouille, Michel, to Commissariat a l'Energie Atomique. Process and apparatus for analyzing a sample by emission spectrography. 4,191,475, Cl. 356-318.000.
Southgate, John P.: *See*—
Williams, Malcolm; Tingey, Albert R.; Southgate, John P.; and Russell, Steven J., 4,191,137, Cl. 123-32.0EH.
Southwire Company: *See*—
Headrick, J. Charles; Peel, Robert C.; and Starnes, R. Emory, 4,191,319, Cl. 228-147.000.
Specht, Steven J., to Olin Corporation. Reinforced casing for an electrode for a diaphragm-type electrolytic cell and a method of fabrication. 4,191,627, Cl. 204-296.000.
Spector, George: *See*—
Froess, Jacob; and Spector, George, 4,191,034, Cl. 70-258.000.
Speiser, Arthur S.; and Sheterom, Samuel G., Jr. Fluid-operated vise with jaw mounting system. 4,191,367, Cl. 269-203.000.
Spencer, Joseph C.: *See*—
Miller, Wayne R.; Latham, David D.; and Spencer, Joseph C., 4,191,061, Cl. 74-108.000.
Spercel, Robert J. Tuning device. 4,191,086, Cl. 84-306.000.
Sperry Corporation: *See*—
Armstrong, James B.; and Trimmier, J. Robert, 4,191,725, Cl. 264-261.000.
Solie, Leland P., 4,191,934, Cl. 333-155.000.
Spina, Joseph; and Weibel, Michael K., to Novo Laboratories, Inc. Intralenticular cataract surgery. 4,191,176, Cl. 128-1.00R.
Spring Hill Laboratories, Inc.: *See*—
Goldberg, Jerome; and Bloch, Christopher D., 4,191,274, Cl. 180-282.000.
Springer, Joseph F.; and Kaplan, Donald H., to RCA Corporation. Switch matrix for data transfers. 4,191,941, Cl. 340-166.00R.
Sramek, Bohumir. Low cost multi-channel recorder and display system for medical and other applications. 4,191,962, Cl. 346-110.00R.
Staab, Robert A.: *See*—
Halas, Linda A.; Gilbert, Lawrence A.; Staab, Robert A.; Collins, Royal D.; and Ries, Charles R., 4,191,661, Cl. 252-103.000.
Stache, Ulrich: *See*—
Fritsch, Werner; Stache, Ulrich; and Lindner, Ernst, 4,191,765, Cl. 424-248.530.
Stackman, Robert W.; and Kuczynski, Edward J., to Celanese Corporation. Melt processable wholly aromatic polyester composition containing a phosphorus ester. 4,191,681, Cl. 260-45.70P.
Stamicarbon, B.V.: *See*—
Tels, Martinus; Lotens, Jan P.; and Kivits, Hendrikus P. M., 4,191,728, Cl. 423-24.000.
Stamm, Russell D., to General Instrument Corporation. Low profile pushbutton tuner with improved carriage moving mechanism. 4,191,058, Cl. 74-10.330.
Standard Oil Company (Indiana): *See*—
Quick, Leonard M.; and Hensley, Albert L., Jr., 4,191,635, Cl. 208-89.000.
Stanley Drug Products, Inc.: *See*—
Cook, Elton S.; and Fujii, Akira, 4,191,779, Cl. 424-319.000.
Stanton, Robert M.: *See*—
Brown, John F.; and Stanton, Robert M., 4,191,789, Cl. 427-97.000.
Stark, Virgil; Vayda, Alexandre; and Rousset, Paul, to Stark, Virgil. Solar energy conversion. 4,191,594, Cl. 136-89.0PC.
Starnes, R. Emory: *See*—
Headrick, J. Charles; Peel, Robert C.; and Starnes, R. Emory, 4,191,319, Cl. 228-147.000.
Stars Stampaggio Resine Speciali S.p.A.: *See*—
Faudarole, Ernesto, 4,191,165, Cl. 126-445.000.
State of Minnesota as represented by the Commissioner of Natural Resources: *See*—
Malterer, Thomas J., 4,191,263, Cl. 173-28.000.
Stauffer Chemical Company: *See*—
Large, George B.; and Buren, Lawrence, 4,191,552, Cl. 71-86.000.
Magee, Walter L., Jr., 4,191,582, Cl. 106-38.200.
Stave, Frederick R., to RCA Corporation. Apparatus for facilitating carriage return in video disc player. 4,191,381, Cl. 274-9.00B.
Stearns, Joseph E.: *See*—
Bollmer, Jacob A.; Stearns, Joseph E.; and Brooks, Alvin R., Jr., 4,191,076, Cl. 83-13.000.
Stegall, Jack L.: *See*—
Mattson, Frank J.; Lawler, John T.; Stegall, Jack L.; and Dawkins, Kenneth R., 4,191,209, Cl. 137-486.000.
Steiger Tractor, Inc.: *See*—
Monteith, Donald A., 4,191,270, Cl. 180-53.00D.
Steinbach, Robert L., to Chicago Lock Co. Axial split-pin tumbler-type lock mechanism and key therefor. 4,191,036, Cl. 70-363.000.
Steinhilber, Wilhelm A., to Orion Machinery & Engineering Corp. Wire cutting flying shear. 4,191,078, Cl. 83-320.000.
Stepantsov, Georgy K.; Abramov, Valentin S.; Bloschitsyn, Jury N.; and Zaripov, Raif R. Power hammer with opposed movement of ram and bolster. 4,191,045, Cl. 72-407.000.
Stephans, Earl: *See*—
Gow, John, 3rd; Hoffman, Herman S.; and Stephans, Earl, 4,191,938, Cl. 338-195.000.
Sterrett, Charles C.: *See*—
Brenner, William C.; and Sterrett, Charles C., 4,191,903, Cl. 310-213.000.
Steuernagel, Hans H.; and Hoyer, Ernst, to Hoechst Aktiengesellschaft. Process for the manufacture of sulfuric acid semi-ester compounds. 4,191,703, Cl. 260-458.00C.
Stevens, William D., to Foster Wheeler Energy Corporation. Vapor generating system utilizing integral separators and angularly arranged furnace boundary wall fluid flow tubes having rifled bores. 4,191,133, Cl. 122-235.00R.
Stewart, Norman C.: *See*—
Lebowitz, Howard E.; Wolk, Ronald H.; Alpert, Seymour B.; Stewart, Norman C.; and Rovesti, William C., 4,191,700, Cl. 260-449.00M.
Stewart, William S.; and Hobbs, James W., to Phillips Petroleum Company. Compressor control. 4,191,511, Cl. 417-18.000.
Steyr-Daimler-Puch-Aktiengesellschaft: *See*—
Zedrosser, Ulrich, 4,191,089, Cl. 89-181.000.
Stickels, Charles A.; and Janotik, Adam M., to Ford Motor Company. Method of heat treating high carbon alloy steel parts to develop surface compressive residual stresses. 4,191,599, Cl. 148-16.500.
Stickl, Helmut: *See*—
Mayr, Anton; Stickl, Helmut; and Westhues, Melchior, 4,191,745, Cl. 424-90.000.
Stiebel Eltron GmbH & Co. KG: *See*—
Schiedat, Heinz, 4,191,304, Cl. 220-414.000.
Stigter, Hendrik G.: *See*—
Hinze, Adrien G.; and Stigter, Hendrik G., 4,191,669, Cl. 260-18.00N.
Stillhard, Bruno; and Naf, Hans, to Gebrueder Buehler AG. Process and apparatus for manufacturing molded parts from granulated plastic materials. 4,191,726, Cl. 264-517.000.
Stillman, Robert A.: *See*—
Haney, Richard M.; Stillman, Robert A.; and Codrington, Robert S., 4,191,919, Cl. 324-312.000.
Stimson, Norman F., deceased: *See*—
Fox, Stephen N. W.; Snook, Edward H.; and Stimson, Norman F., deceased, 4,191,271, Cl. 180-77.0TC.
Stimson, Verity S., personal representative: *See*—
Fox, Stephen N. W.; Snook, Edward H.; and Stimson, Norman F., deceased, 4,191,271, Cl. 180-77.0TC.
Stockdale, Roy, to Napco Security System Inc. Digital transmission apparatus particularly adapted for security systems. 4,191,948, Cl. 340-539.000.
Stoddard, Xerxes T.; Vaseen, Vesper A.; and Terry, Ruel C. Wet oxidation engine. 4,191,012, Cl. 60-39.050.
Stohr, Gunter: *See*—
Kratel, Gunter; Stohr, Gunter; and Katzer, Hans, 4,191,587, Cl. 106-308.00Q.
Stone, Ricardo R.: *See*—
Brock, George W.; Pawlowski, Edward J.; and Stone, Ricardo R., 4,192,003, Cl. 364-487.000.
Stone & Webster Engineering Corporation: *See*—
Rubin, Jacob N.; and Seufert, Frederick B., 4,191,845, Cl. 585-253.000.

Stoneleigh Trust, Fred M. Dellorfano, Jr. & Donald P. Massa, Trustees, The: *See*—
Massa, Frank, 4,190,937, Cl. 29-25.350.

Strahl, Victor H., to Pullman Incorporated. Sealing arrangement for chimneys with an annular pressurized space. 4,191,099, Cl. 98-60.000.

Strand, Norman S., to Federal Screw Works. Self-locking threaded fastener product. 4,191,677, Cl. 260-37.0EP.

Straslicka, William A.: *See*—
Samurin, Norman A.; and Straslicka, William A., 4,191,485, Cl. 403-15.000.

Strauch, Dieter; and Werner, Rudiger, to Pluss-Staufer AG. Surface-treated mineral filler. 4,191,670, Cl. 260-23.0AR.

Streakers International Incorporated, The: *See*—
Cherry, Richard S., 4,191,436, Cl. 312-293.000.

Strem, R. C.: *See*—
Strem, Robert C.; Strem, R. C.; and Eberle, John H., 4,191,153, Cl. 123-133.000.

Strem, Robert C.; Strem, R. C.; and Eberle, John H., to Omnewtronics, Inc. Assembly and method of vaporizing liquid gasoline fuel and system. 4,191,153, Cl. 123-133.000.

Stroman, Fritz: *See*—
Kingler, Karl H.; Thiemer, Klause; and Stroman, Fritz, 4,191,777, Cl. 424-316.000.

Stroucken, Klaus; Winberg, Torbjorn; and Lindfors, Kaj, to Alfa-Laval AB. Centrifuge with sludge outlets at rotor periphery. 4,191,325, Cl. 233-20.00A.

Strow, Lawrence E.: *See*—
Fischer, Arthur H.; Strow, Lawrence E.; and Bolth, Franklin A., 4,191,641, Cl. 209-166.000.

Struck, Bernd D., to Kernforschungsanlage Julich Gesellschaft mit beschrankter. Process for conversion of materials in electrolytic solution. 4,191,619, Cl. 204-104.000.

Stutz, Herbert: *See*—
Illers, Karl H.; and Stutz, Herbert, 4,191,818, Cl. 528-44.000.

Stutzinger, Ferdinand: *See*—
Bohn, Hans; and Stutzinger, Ferdinand, 4,191,533, Cl. 23-230.00B.

Su, Kenneth S.; Templeton, Robert J.; and Wikel, James H., to Eli Lilly and Company. Separation of syn and anti oximes of 1-sulfonyl-2-aminobenzimidazoles. 4,191,832, Cl. 548-306.000.

Suarato, Antonino: *See*—
Masi, Paolo; Suarato, Antonino; Bernardi, Luigi; and Arcamone, Federico, 4,191,755, Cl. 424-180.000.
Masi, Paolo; Suarato, Antonino; Bernardi, Luigi; and Arcamone, Federico, 4,191,756, Cl. 424-180.000.

Sudduth, Jerome R.: *See*—
Keyworth, Donald A.; and Sudduth, Jerome R., 4,191,588, Cl. 134-2.000.

Suffern, Bruce C., to Illinois Tool Works Inc. Two-way container package. 4,191,290, Cl. 206-150.000.

Sugimura, Kazuhisa: *See*—
Yamamura, Yuichi; Azuma, Ichiro; Sugimura, Kazuhisa; Morimoto, Hiroshi; Imada, Isuke; and Watanabe, Masazumi, 4,191,778, Cl. 424-317.000.

Sugiyama, Masatoshi: *See*—
Okita, Tsutomu; Satou, Masami; Hibino, Noburo; Katoh, Kazunobu; and Sugiyama, Masatoshi, 4,191,679, Cl. 260-40.00R.

Suld, George: *See*—
Lyons, James E.; Shinn, Robert W.; and Suld, George, 4,191,839, Cl. 560-241.000.

Suling, Carlhans: *See*—
Lindner, Christian; Suling, Carlhans; Bartl, Herbert; Schreckenberg, Manfred; Freitag, Dieter; and Konig, Klaus, 4,191,705, Cl. 260-463.000.

Sullivan, James W., to Brown & Williamson Tobacco Corporation. Apparatus and process for reclaiming tobacco. 4,191,199, Cl. 131-96.000.

Sumitomo Chemical Company, Limited: *See*—
Kojimoto, Susumu; Sato, Takami; and Mori, Toshio, 4,191,518, Cl. 425-326.100.
Okabe, Hiromichi; Kishimoto, Kiyomi; and Ohi, Fumio, 4,191,708, Cl. 260-582.000.

Sumitomo Electric Industries, Ltd.: *See*—
Inagaki, Yutaka; Matsubara, Hironaga; and Ishise, Kojiro, 4,191,675, Cl. 260-29.300.

Sunde, Paul B. Seismic safety cutoff switch. 4,191,868, Cl. 200-61.500.

Sundheim, John J., to John J. Sundheim Family Estate, The Method and apparatus for cleaning carpets and surfaces using cleaning fluid. 4,191,590, Cl. 134-21.000.

Sundstrand Corporation: *See*—
Flippo, Robert V., 4,191,094, Cl. 91-506.000.

Sunohara, Junji: *See*—
Nishio, Kanemitsu; Yoshida, Mitsutaka; Suzuki, Takashi; and Sunohara, Junji, 4,191,155, Cl. 123-148.00P.

Suntech, Inc.: *See*—
Lyons, James E.; Shinn, Robert W.; and Suld, George, 4,191,839, Cl. 560-241.000.

Suzuki, Noboru: *See*—
Saitoh, Shigeru; and Suzuki, Noboru, 4,191,114, Cl. 110-248.000.

Suzuki, Takashi: *See*—
Nishio, Kanemitsu; Yoshida, Mitsutaka; Suzuki, Takashi; and Sunohara, Junji, 4,191,155, Cl. 123-148.00P.

Suzuki, Tetsuro: *See*—
Oishi, Masaaki; Ashida, Itaru; and Suzuki, Tetsuro, 4,191,067, Cl. 74-577.00M.

Svedberg, Lennart, to Forsheda Gummifabrik AB. Method and device for sealing a pipe joint. 4,191,384, Cl. 277-1.000.

Swanson, Billy L., to Phillips Petroleum Company. Compositions for acidizing subterranean formations. 4,191,657, Cl. 252-8.55C.

Sweeney, Ralph B.; and Verdouw, Albert J., to General Motors Corporation. Mount assembly for porous transition panel at annular combustor outlet. 4,191,011, Cl. 60-39.320.

Swift, Harold E.; Madgavkar, Ajay M.; and Vogel, Roger F., to Gulf Research and Development Company. Reduction of carbon monoxide in substoichiometric combustion. 4,191,733, Cl. 423-245.000.

Swiss Aluminium Ltd.: *See*—
Faris, Charles G.; and Manley, Edward H., 4,191,954, Cl. 340-679.000.

Sybron Corporation: *See*—
Cowell, David, 4,191,889, Cl. 250-402.000.

Sykes, Donald J.; and Pratt, Louis D., to Philip A. Hunt Chemical Corp. Two-step photographic processing of black and white images which enhances the images by controlled bleaching during fixing immediately following development and which produces black and white images with reduced density in low density areas. 4,191,575, Cl. 430-418.000.

Sylvester, Merton E. Agriculture light tillage implement and tool mounting mechanism therefor. 4,191,262, Cl. 172-459.000.

Symborski, Alex P., to Owens-Corning Fiberglas Corporation. Textile strand control device. 4,191,079, Cl. 83-347.000.

Symonds, John D.: *See*—
Hails, George; and Symonds, John D., 4,191,579, Cl. 106-15.00R.

Syntex (U.S.A.) Inc.: *See*—
Beard, Colin C., 4,191,764, Cl. 424-248.550.

Systems Operations, Inc.: *See*—
Goldman, Max; and Alexoff, Carl, 4,191,376, Cl. 273-139.000.

Syva Company: *See*—
Ullman, Edwin F.; and Rubenstein, Kenneth E., 4,191,613, Cl. 435-188.000.

Szabo, Bela G., to Bruce Plastics, Inc. Duplex handles of molded plastic material. 4,191,232, Cl. 150-12.000.

Szekely, Istvan; Kovacs, Gabor; Virag, Sandor; and Szentivanyi, Matyas, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T. Novel 17-aza-$PGF_{2\alpha}$ derivatives and pharmaceutical compositions containing the same. 4,191,774, Cl. 424-300.000.

Szentivanyi, Matyas: *See*—
Szekely, Istvan; Kovacs, Gabor; Virag, Sandor; and Szentivanyi, Matyas, 4,191,774, Cl. 424-300.000.

Szydlowski, William J., to Zenith Radio Corporation. Shielding means for television picture tube electrical feed-through receptacles. 4,191,973, Cl. 358-245.000.

ta Huang, Kwang; and Milner, Brian R., to United States of America, Navy. Power line transient suppressors. 4,191,986, Cl. 361-58.000.

Taguchi, Yasuo: *See*—
Nagano, Katsumi; and Taguchi, Yasuo, 4,191,856, Cl. 179-15.00A.

Takabe, Koichi: *See*—
Endo, Takaya; Sato, Shui; Kikuchi, Shoji; Kozima, Tamotsu; Usui, Tugumoto; Imamura, Hiroyuki; and Takabe, Koichi, 4,191,574, Cl. 430-387.000.

Takahashi, Kihei, to Yoshida Kogyo K.K. Gasket installing device. 4,190,943, Cl. 29-235.000.

Takahashi, Takuya: *See*—
Kataoka, Nobuyuki; Takahashi, Takuya; Ohkawa, Fujio; and Anzai, Shiro, 4,191,671, Cl. 260-23.70M.

Takeda Chemical Industries, Ltd.: *See*—
Yamamura, Yuichi; Azuma, Ichiro; Sugimura, Kazuhisa; Morimoto, Hiroshi; Imada, Isuke; and Watanabe, Masazumi, 4,191,778, Cl. 424-317.000.

Takenaga, Senzo. Spiral staircase. 4,190,992, Cl. 52-187.000.

Takeshita, Masahiro; Kawashima, Kazumi; Ueda, Minoru; and Yamamoto, Keisuke, to Matsushita Electric Industrial Co., Ltd. Channel selection apparatus. 4,191,924, Cl. 325-465.000.

Talarico, Lawrence J. Tray loader. 4,191,003, Cl. 53-247.000.

Talwar, Gursaran P., to All India Institute of Medical Sciences. Sterilization process for mammals. 4,191,746, Cl. 424-92.000.

Tamaoka, Yutaka: *See*—
Hayasaka, Kuniyuki; and Tamaoka, Yutaka, 4,191,623, Cl. 204-180.00R.

Tams, Frederick J., III, to RCA Corporation. Processing rack. 4,191,295, Cl. 211-41.000.

Tanada, Eiji, to Sharp Kabushiki Kaisha. Interferences reduction for use in an FM radio receiver. 4,191,850, Cl. 179-1.0GD.

Tanaka, Junzo; Kusunoki, Shigeru; and Yoshimura, Hirofumi, to Matsushita Electric Industrial Co., Ltd. Microwave oven equipped with electric heating arrangement. 4,191,877, Cl. 219-10.55B.

Tanaka, Katsufusa; and Tanakura, Isamu, to Mitsubishi Denki Kabushiki Kaisha. Vibration detector device. 4,191,869, Cl. 200-61.45R.

Tanaka, Masayuki: *See*—
Nagashima, Tomoyuki; Tanaka, Masayuki; and Shinomiya, Shigeo, 4,191,269, Cl. 180-27.000.

Tanakura, Isamu: *See*—
Tanaka, Katsufusa; and Tanakura, Isamu, 4,191,869, Cl. 200-61.45R.

Tanimoto, Yoshinori: *See*—
Watanabe, Toshio; and Tanimoto, Yoshinori, 4,191,194, Cl. 128-692.000.

Tanita Corporation: *See*—
Miyoshi, Tsutomu; Yanagita, Shuichi; and Komachi, Yushi, 4,191,268, Cl. 177-210.00C.

Taplin, Lael B., to Bendix Corporation, The. Means for optimizing fuel economy in an internal combustion engine. 4,191,146, Cl. 123-117.00R.

Tarantino, Phillip. Hand operated tool with central opening in upper portion. 4,191,261, Cl. 172-371.000.
Taylor, David L., to Harris Semiconductor. CMOS-bipolar EAROM. 4,192,016, Cl. 365-163.000.
Taylor, Lynn J.; and Tobias, John W., to Owens-Illinois, Inc. Degradable article. 4,191,320, Cl. 229-3.50R.
Taylor, Robert J.: *See—*
Bontrager, Kenneth L.; Bontrager, Marion R.; Taylor, Robert J.; and Card, David C., 4,191,224, Cl. 141-100.000.
TDK Electronics Company, Limited: *See—*
Sato, Takateru; and Shoji, Shigemasa, 4,191,345, Cl. 242-197.000.
Techsight Corp.: *See—*
Weber, Hermann P., 4,191,804, Cl. 428-409.000.
Teglund, Lars; and Oldani, Melchiorre, to AB Gustavsberg. Plumbing apparatus including means for producing a water-plug effect in sanitation appliances. 4,190,910, Cl. 4-421.000.
Tektronix, Inc.: *See—*
Nelson, Larry A., 4,191,965, Cl. 358-10.000.
Teledyne Industries, Inc.: *See—*
Karpal, David L., 4,191,807, Cl. 429-176.000.
Tels, Martinus; Lotens, Jan P.; and Kivits, Hendrikus P. M., to Stamicarbon, B.V. Process for selective extraction of metal ions from aqueous solutions and extracting agents suitable for that purpose. 4,191,728, Cl. 423-24.000.
Templeton, Robert J.: *See—*
Su, Kenneth S.; Templeton, Robert J.; and Wikel, James H., 4,191,832, Cl. 548-306.000.
Tenneco Chemicals, Inc.: *See—*
Keyworth, Donald A.; and Sudduth, Jerome R., 4,191,588, Cl. 134-2.000.
Teraji, Tsutomu: *See—*
Kamiya, Takashi; Teraji, Tsutomu; Hashimoto, Masashi; Nakaguti, Osamu; and Oku, Teruo, 4,191,762, Cl. 424-246.000.
Teres, Leonid N.: *See—*
Antipov, Georgy A.; Gelfand, Mikhail L.; Lavnikov, Nikolai S.; Teres, Leonid N.; Urazhdin, Ivan I.; Tsipenjuk, Yakov I.; and Yakubovsky, Petr S., 4,191,264, Cl. 173-93.600.
Terrier Machine Corporation: *See—*
Wettlaufer, Dale E., 4,191,103, Cl. 100-110.000.
Terry, Ruel C.: *See—*
Stoddard, Xerxes T.; Vaseen, Vesper A.; and Terry, Ruel C., 4,191,012, Cl. 60-39.050.
Texaco Development Corp.: *See—*
Marquis, Edward T.; and Yeakey, Ernest L., 4,191,706, Cl. 260-559.00A.
Texaco Inc.: *See—*
Chess, David D.; Helbling, Clements A., Jr.; and Smith, Randlow, 4,191,640, Cl. 208-348.000.
Kalfoglou, George, 4,191,253, Cl. 166-275.000.
Scott, Hubert D., 4,191,884, Cl. 250-270.000.
Texas Instruments Incorporated: *See—*
Armstrong, James J., 4,190,951, Cl. 29-628.000.
Textron, Inc.: *See—*
Brent, Robert G., 4,191,202, Cl. 137-112.000.
Teysseyre, Pierre M.; and Baudier, Claude P., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation (S.N.E.C.M.A.). Axial flow compressor rotor drum. 4,191,510, Cl. 416-230.000.
Th. Goldschmidt AG: *See—*
Brugger, Wilhelm, 4,191,727, Cl. 423-1.000.
Thelander, W. Vincent, Sr.; and Lindquist, Terry K., to Borg-Warner Corporation. Wear compensator for Belleville spring clutch. 4,191,285, Cl. 192-111.00A.
Thiemer, Klause: *See—*
Kingler, Karl H.; Thiemer, Klause; and Stroman, Fritz, 4,191,777, Cl. 424-316.000.
Thomas, Michael J.: *See—*
Walch, Robert L., Jr.; Carey, Van P.; and Thomas, Michael J., 4,191,172, Cl. 126-421.000.
Thomas, Philip J.; and McAllister, John A., to Circuit Assembly Corp. Insulation displacement connector adapter. 4,190,952, Cl. 29-629.000.
Thomas, Tom A., III: *See—*
Marsh, Paul A., Jr.; and Thomas, Tom A., III, 4,190,994, Cl. 52-262.000.
Thompson, Stanley R.: *See—*
Batha, Howard D.; Mason, John H.; and Thompson, Stanley R., 4,191,730, Cl. 423-239.000.
Thomson-CSF: *See—*
Dansac, Jean; Pepin, Christian; and Cammas, Henri, 4,191,967, Cl. 358-113.000.
Thomson, Ian M., to Cable Belt Limited. Ropes and the like. 4,191,009, Cl. 57-202.000.
Thorn, Michael R. Fuel oil supply system having an electrically heated filter. 4,191,524, Cl. 431-208.000.
Thorpe, Laurence J.: *See—*
Dischert, Robert A.; and Thorpe, Laurence J., 4,191,971, Cl. 358-210.000.
Tillac, Jean-Francois, to Societe Nationale des Poudres et Explosifs. Device for causing rotation, having a pressurized tubular drive means. 4,191,344, Cl. 242-107.000.
Timjoist, Inc.: *See—*
Henderson, Larry R., 4,191,000, Cl. 52-729.000.
Timm, Gerald W.: *See—*
Bradley, William E.; Timm, Gerald W.; Klatt, William M.; and Graves, Wayne H., 4,191,196, Cl. 128-733.000.
Tingey, Albert R.: *See—*
Williams, Malcolm; Tingey, Albert R.; Southgate, John P.; and Russell, Steven J., 4,191,137, Cl. 123-32.0EH.
Titus, Wallace J.: *See—*
Conybear, James G.; and Titus, Wallace J., 4,191,598, Cl. 148-16.500.
Tobias, John W.: *See—*
Taylor, Lynn J.; and Tobias, John W., 4,191,320, Cl. 229-3.50R.
Tokico Ltd.: *See—*
Karasudani, Yasuo, 4,191,278, Cl. 188-73.300.
Tokui, Kazuo: *See—*
Noda, Masahiro; and Tokui, Kazuo, 4,191,894, Cl. 307-116.000.
Tokuyoshi, Fujiki: *See—*
Aomura, Kunio; Tokuyoshi, Fujiki; and Nakamae, Masahiko, 4,191,595, Cl. 148-1.500.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Ikeda, Masashi; and Kihara, Kazuo, 4,190,949, Cl. 29-571.000.
Nagano, Katsumi; and Taguchi, Yasuo, 4,191,856, Cl. 179-15.00A.
Tomczak, James J.; and Wilson, Richard N., to International Business Machines Corporation. Voltage variable integrated circuit capacitor and bootstrap driver circuit. 4,191,899, Cl. 307-303.000.
Tompkins, Vincent J. Engine with secondary pistons. 4,191,139, Cl. 123-48.00A.
Tompsett, Alan J.: *See—*
Parker, David G.; and Tompsett, Alan J., 4,191,709, Cl. 260-583.00R.
Tompsett, Michael F., to Bell Telephone Laboratories, Incorporated. Optical image sensor semiconductor apparatus. 4,192,015, Cl. 365-114.000.
Toriumi, Shiro: *See—*
Watanabe, Yutaka; Yamagishi, Seiichi; and Toriumi, Shiro, 4,191,455, Cl. 353-27.00A.
Toro Company, The: *See—*
Bivens, Jon A.; and Cochran, Wilson V., 4,191,331, Cl. 239-231.000.
Check, Joseph M.; and Reed, E. Smith, Jr., 4,191,007, Cl. 56-199.000.
Walto, Joseph J., 4,190,954, Cl. 30-347.000.
Torrington, Leslie A.: *See—*
Allen, James A.; and Torrington, Leslie A., 4,191,380, Cl. 274-9.00B.
Toshiba Kikai Kabushiki Kaisha: *See—*
Ogawa, Akira; Masuda, Toyoaki; and Miura, Osamu, 4,191,101, Cl. 99-323.300.
Sato, Mituharu; and Yamazaki, Katsuo, 4,190,947, Cl. 29-568.000.
Tosi, Carlo, to Instituto Franco Tosi S.p.A. Bromhexine derivatives and process for making same. 4,191,780, Cl. 424-324.000.
Toth, William E.: *See—*
Bowditch, Philip N.; Dahlen, John M.; McKenna, John F., Jr.; Shillingford, John T., Jr.; Siraco, Frank J.; and Toth, William E., 4,191,049, Cl. 73-170.00A.
Tousley-Bixler Construction Co. Inc.: *See—*
Shuck, William D.; Lind, Frederick D.; and Cole, John W., 4,191,479, Cl. 366-101.000.
Tovrog, Benjamin S.; Diamond, Steven E.; and Mares, Frank, to Allied Chemical Corporation. Oxidation process using metal nitro complex. 4,191,696, Cl. 260-348.330.
Towae, Friedrich: *See—*
Merger, Franz; Towae, Friedrich; and Penzel, Erich, 4,191,838, Cl. 560-205.000.
Toyama, Tadao; and Iwasaki, Masayuki, to Fuji Photo Film Co., Ltd. Photosensitive positive image forming process with two photo-sensitive layers. 4,191,573, Cl. 430-166.000.
Toyo Seikan Co., Ltd.: *See—*
Hirata, Masuzo, 4,191,449, Cl. 350-97.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Katahira, Eturou; Yamaguchi, Shunzo; Kida, Masashi; Ishida, Yasuhiko; and Miyagi, Hideo, 4,191,013, Cl. 60-276.000.
Kawata, Shoji; and Sakakibara, Naoji, 4,191,051, Cl. 73-347.000.
Kuramoto, Akio; and Kawai, Takeo, 4,191,272, Cl. 180-84.000.
Nohira, Hidetaka; Ito, Sumio; and Ohki, Hisashi, 4,191,135, Cl. 123-30.00C.
Nohira, Hidetaka; Kobashi, Kiyoshi; and Nakano, Jiro, 4,191,144, Cl. 123-117.00R.
Shibata, Norio, 4,191,154, Cl. 123-136.000.
Yuuki, Kiyoshi, 4,191,143, Cl. 123-117.00A.
Yuuki, Kiyoshi, 4,191,147, Cl. 123-117.00A.
Transco Inc.: *See—*
Wickenberg, Chester H., 4,191,109, Cl. 410-149.000.
Transkrit Corporation: *See—*
Michlin, Irving R., 4,191,402, Cl. 282-23.00R.
Traven, Lars J. C.: *See—*
Andersson, Roland J. E.; Larsson, Lars-Ake L.; and Traven, Lars J. C., 4,191,359, Cl. 251-9.000.
Larsson, Lars-Ake L.; and Traven, Lars J. C., 4,191,646, Cl. 210-103.000.
Tridon-Serflex S.A.: *See—*
Luc, Andre R., 4,191,123, Cl. 113-116.00H.
Triebel, Wolfgang, to Polysius AG. Suspension gas preheater. 4,191,526, Cl. 432-58.000.
Trimmier, J. Robert: *See—*
Armstrong, James B.; and Trimmier, J. Robert, 4,191,725, Cl. 264-261.000.
Tripoint, Inc.: *See—*
Kaye, Dianne, 4,191,219, Cl. 139-383.00R.

Trokhan, Paul D., to Procter & Gamble Company, The. Soft absorbent imprinted paper sheet and method of manufacture thereof. 4,191,609, Cl. 162-113.000.
Trouillard, Charles, to Bolli, Hilda. Apparatus for the dehydration of waste and vegetable matter. 4,191,527, Cl. 432-72.000.
Tru-Spoke, Inc.: *See*—
Bradley, Robert A., 4,191,427, Cl. 301-108.00S.
Trutzchler GmbH & Co. KG.: *See*—
Trutzschler, Hans, 4,190,932, Cl. 19-81.000.
Trutzschler GmbH & Co. KG.: *See*—
Jagst, Peter, 4,190,933, Cl. 19-81.000.
Trutzschler, Hans, to Trutzchler GmbH & Co. KG. Method and apparatus for opening textile fiber bales. 4,190,932, Cl. 19-81.000.
TRW Inc.: *See*—
Harrington, Alan L., 4,191,788, Cl. 427-82.000.
Tsipenjuk, Yakov I.: *See*—
Antipov, Georgy A.; Gelfand, Mikhail L.; Lavnikov, Nikolai S.; Teres, Leonid N.; Urazhdin, Ivan I.; Tsipenjuk, Yakov I.; and Yakubovsky, Petr S., 4,191,264, Cl. 173-93.600.
Tsukidate, Yoshitaka; and Sasaki, Shin, to Sony Corporation. Tape cassette. 4,191,984, Cl. 360-132.000.
Tsuyoshi, Makino: *See*—
Yoshikazu, Nakajima; Kazumasa, Suzuki; and Tsuyoshi, Makino, 4,191,810, Cl. 435-177.000.
Tube Engineers, Inc.: *See*—
Holden, Edward S., 4,191,056, Cl. 73-743.000.
Tucker, Harold A., to B.F. Goodrich Company, The. Ethylenically unsaturated blocked aromatic diisocyanates. 4,191,833, Cl. 548-378.000.
Tucker, Harold A., to B.F. Goodrich Company, The. Ethylenically unsaturated blocked aromatic diisocyanates. 4,191,834, Cl. 548-305.000.
Tucker, Percy A. Apparatus and method for winding and inserting sheet material into a tube. 4,190,942, Cl. 29-451.000.
Tungum Hydraulics Limited: *See*—
Lawrence, Anthony J., 4,190,940, Cl. 29-156.40R.
Turner, James E., to Entek Corporation. Extruding machine and end products. 4,191,522, Cl. 425-552.000.
Ueda, Minoru: *See*—
Takeshita, Masahiro; Kawashima, Kazumi; Ueda, Minoru; and Yamamoto, Keisuke, 4,191,924, Cl. 325-465.000.
Ueno, Yutaka: *See*—
Ono, Fumitaka; Semasa, Takayoshi; Ueno, Yutaka; and Iwata, Shuzi, 4,191,974, Cl. 358-261.000.
Ullman, Edwin F.; and Rubenstein, Kenneth E., to Syva Company. Malate dehydrogenase conjugates for enzyme immunoassays. 4,191,613, Cl. 435-188.000.
Ulmer, Richard W., to Motorola, Inc. High voltage CMOS circuit. 4,191,898, Cl. 307-264.000.
Uni-Cardan Aktiengesellschaft: *See*—
Girguis, Sobhy L.; and Krude, Werner, 4,191,031, Cl. 64-21.000.
Uni-Drive (Tractors) Limited: *See*—
Copperwheat, Cyril, 4,191,280, Cl. 188-300.000.
Unicon Parking Structures, Inc.: *See*—
Rice, Edward K., 4,191,002, Cl. 52-747.000.
Union Carbide Corporation: *See*—
Dollman, David Y.; and O'Grady, Timothy J., 4,191,596, Cl. 148-6.270.
Hall, Wilbur S., 4,191,676, Cl. 260-29.70R.
Moyer, Charles E., Jr.; Keller, George E., II; Beisner, Robert W.; and Walker, Wellington E., 4,191,701, Cl. 260-450.000.
Pelton, John F., 4,191,486, Cl. 403-28.000.
Union Oil Company of California: *See*—
Light, Steven D.; and Ward, John W., 4,191,637, Cl. 208-139.000.
McArthur, Dennis P., 4,191,664, Cl. 252-466.00J.
Sarem, Amir M., 4,191,249, Cl. 166-244.00C.
Young, Donald C.; and Fleck, Raymond N., 4,191,620, Cl. 204-149.000.
Union Siderurgique du Nord et de l'est de la France: *See*—
Voituriez, Henry; and Aymard, Rene, 4,191,410, Cl. 285-367.000.
United Kingdom Atomic Energy Authority: *See*—
Keats, Albert B.; and Leggett, Dudley W., 4,192,013, Cl. 365-91.000.
Williams, John A., 4,191,022, Cl. 62-55.500.
United States of America
Air Force: *See*—
Quinlan, Kenneth P.; and Hutta, Joseph J., 4,191,561, Cl. 75-101.00R.
Army: *See*—
Basso, Michael J.; and Brown, Henry B., 4,191,886, Cl. 250-376.000.
Campbell, Billy H.; Debona, Edward J.; and Laird, William J., 4,191,087, Cl. 89-1.806.
Drzewiecki, Tadeusz M., 4,191,052, Cl. 73-357.000.
Gardiner, Arthur L.; and Castillo, Tomas R., 4,191,088, Cl. 89-33.00C.
Kerr, John L., 4,191,959, Cl. 343-700.0MS.
Energy: *See*—
Emmett, John L., 4,191,928, Cl. 330-4.300.
McDowell, William J., 4,191,628, Cl. 208-8.00R.
Skotheim, Terje A., 4,190,950, Cl. 29-572.000.
Yang, Ralph T.; and Shen, Ming-shing, 4,191,115, Cl. 110-347.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Collins, Earl R. System for slicing silicon wafers. 4,191,159, Cl. 125-21.000.
National Aeronautics and Space Administration: *See*—
Grana, David C.; and Wilem, Richard T., 4,191,893, Cl. 290-53.000.
Kaufman, John W., 4,191,505, Cl. 415-2.000.
Navy: *See*—
Audet, Norman F.; and Orner, George M., 4,191,028, Cl. 62-259.000.
Mittleman, John; Warrell, Charles O.; and Peterson, Ronald S., 4,191,461, Cl. 354-64.000.
Schwee, Leonard J.; Anderson, Wallace E.; Liu, Yuan-Jye; and Lee, Ronald N., 4,192,012, Cl. 365-87.000.
ta Huang, Kwang; and Milner, Brian R., 4,191,986, Cl. 361-58.000.
U.S. Philips Corporation: *See*—
Arditty, Herve; and Hunzinger, Jean-Jacques, 4,191,446, Cl. 350-96.150.
Beeftink, Maarten C.; and Helgers, Manfred, 4,191,990, Cl. 362-276.000.
Groothuis, Hermanus H. H., 4,191,956, Cl. 340-789.000.
United Technologies Corporation: *See*—
Leonardi, Salvatore A., 4,191,509, Cl. 416-219.00R.
Montress, Gary K.; Grudkowski, Thomas W.; and Reeder, Thomas M., 4,191,933, Cl. 333-151.000.
Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co. KG: *See*—
Sommer, Werner, 4,191,033, Cl. 66-64.000.
University of Miami: *See*—
Ryan, James W., 4,191,753, Cl. 424-177.000.
Upjohn Company, The: *See*—
Axen, Udo F., 4,191,824, Cl. 542-429.000.
Bundy, Gordon L., 4,191,707, Cl. 260-570.5CA.
Bundy, Gordon L., 4,191,837, Cl. 560-55.000.
Johnson, Roy A., 4,191,691, Cl. 260-345.200.
Johnson, Roy A.; and Sih, John C., 4,191,822, Cl. 542-416.000.
Uraneck, Carl A.; and Johnson, Paul H., to Phillips Petroleum Company. Method of removing sulfur dioxide from gases. 4,191,732, Cl. 423-243.000.
Urano, Fumio; Haraguchi, Keisuke; and Arai, Akihiro, to Asahi Kogaku Kogyo Kaisha. Counter device for multiple exposure in a camera. 4,191,463, Cl. 354-217.000.
Urazhdin, Ivan I.: *See*—
Antipov, Georgy A.; Gelfand, Mikhail L.; Lavnikov, Nikolai S.; Teres, Leonid N.; Urazhdin, Ivan I.; Tsipenjuk, Yakov I.; and Yakubovsky, Petr S., 4,191,264, Cl. 173-93.600.
Uruba, Vladimir; and Figalla, Zdenek, to GALA, narodni podnik. Game ball and method of making same. 4,191,375, Cl. 273-65.0EB.
Usui, Tugumoto: *See*—
Endo, Takaya; Sato, Shui; Kikuchi, Shoji; Kozima, Tamotsu; Usui, Tugumoto; Imamura, Hiroyuki; and Takabe, Koichi, 4,191,574, Cl. 430-387.000.
Uzgiris, Egidijus E.; and De Blois, Ralph W., to General Electric Company. Antigen-antibody reaction assay employing particle aggregation and resistive pulse analysis. 4,191,739, Cl. 424-12.000.
Van Coney, Robert H.: *See*—
Byrd, Alan E.; Amneus, John S.; Lucas, Malcolm B.; Van Coney, Robert H.; and Van Loan, James E., 4,191,517, Cl. 425-286.000.
van der Laan, Berend, to Scheepvaartbedrijf "Con Brio" N.V. Dockship. 4,191,124, Cl. 114-123.000.
van der Lely, Cornelis. Soil cultivating implements. 4,191,258, Cl. 172-40.000.
van Eek, Wouter H.; and Grupping, Arnold W. J., to van Eek, Wouter H. Process and installation for drilling holes in the earth's crust under freezing conditions. 4,191,266, Cl. 175-17.000.
Van Linden, Jan H. L.; Miller, Ronald E.; and Herrick, Joseph R., to Aluminum Company of America. Skim removal. 4,191,559, Cl. 75-68.00R.
Van Loan, James E.: *See*—
Byrd, Alan E.; Amneus, John S.; Lucas, Malcolm B.; Van Coney, Robert H.; and Van Loan, James E., 4,191,517, Cl. 425-286.000.
Van Renssen, Marinus, to RCA Corporation. Apparatus and method for determining deviation of mask-to-faceplate spacing in a cathode-ray tube. 4,190,936, Cl. 29-25.150.
van Roggen, Arend: *See*—
Edwards, Donald W.; Gorondy, Emery J.; and van Roggen, Arend, 4,191,961, Cl. 346-74.100.
Vanslette, Robert A., to Brown & Sharpe Manufacturing Company. Linear actuator. 4,191,059, Cl. 74-25.000.
Van Winkle, Howard E., to International Business Machines Corporation. Record storage apparatus employing enhanced transducer positioning servomechanisms. 4,191,981, Cl. 360-99.000.
Vargiu, Silvio; Manzoni, Pier L.; and Bernasconi, Mario, to Euteco S.p.A. Process for forming novolak resin compositions into molding granules. 4,191,723, Cl. 264-129.000.
Varian Associates, Inc.: *See*—
Brown, Karl L., 4,191,887, Cl. 250-396.0ML.
Haney, Richard M.; Stillman, Robert A.; and Codrington, Robert S., 4,191,919, Cl. 324-312.000.
O'Neal, Charles D., III; Blumle, Leo J.; and Hablanian, Marsbed, 4,191,512, Cl. 417-54.000.
Varin, Michel A., to Societe Anonyme dite: Etablissements Georges Olivier. Appliances for cleaning various types of floors by suction or motorized beating or brushing. 4,190,923, Cl. 15-383.000.

Vaseen, Vesper A.: *See—*
Stoddard, Xerxes T.; Vaseen, Vesper A.; and Terry, Ruel C., 4,191,012, Cl. 60-39.050.
Vaughn, Randy L. Key holder. 4,191,038, Cl. 70-457.000.
Vayda, Alexandre: *See—*
Stark, Virgil; Vayda, Alexandre; and Rousset, Paul, 4,191,594, Cl. 136-89.0PC.
Veb Pentacon Dresden Kamera und Kinowerke: *See—*
Schulze, Heinz, 4,191,464, Cl. 354-246.000.
Veber, Daniel F.; and Nutt, Ruth F., to Merck & Co., Inc. Bicyclic somatostatin analogs. 4,191,754, Cl. 424-177.000.
Vedamuthu, Ebenezer R., to Microlife Technics, Inc. Method for diacetyl flavor and aroma development in creamed cottage cheese. 4,191,782, Cl. 426-38.000.
Venditto, Virgil A., Jr.: *See—*
Sinklier, Robert W.; and Venditto, Virgil A., Jr., 4,191,501, Cl. 409-104.000.
Venter, Daniel J. J., to Knipping (Proprietary) Limited. Attachment for a power tool. 4,191,227, Cl. 145-46.000.
Verdouw, Albert J.: *See—*
Sweeney, Ralph B.; and Verdouw, Albert J., 4,191,011, Cl. 60-39.320.
Vereinigte Baubeschlagfabriken Gretsch and Company GmbH: *See—*
Biermann, Peter; and Ewald, Otto, 4,191,396, Cl. 280-615.000.
Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft: *See—*
Haslinger, Leopold; and Krenn, Josef, 4,191,504, Cl. 415-1.000.
Versteeg, Jacobus C., to B.V. Machinefabriek Breda v/h Backer & Rueb. Heat exchangers. 4,191,247, Cl. 165-158.000.
Veyo, Stephen E.: *See—*
Sisk, Francis J.; and Veyo, Stephen E., 4,191,023, Cl. 62-79.000.
Vickers Limited: *See—*
Lawson, Leslie E., 4,191,569, Cl. 430-305.000.
Vig, Ladislav: *See—*
Meyer, Fritz; Heine, Josef; and Vig, Ladislav, 4,191,277, Cl. 187-29.00R.
Villa, Francesco. Decompression ascent computer. 4,192,001, Cl. 364-418.000.
Vinals, Joaquin F.: *See—*
Withycombe, Donald A.; Mookherjee, Braja D.; Vock, Manfred H.; and Vinals, Joaquin F., 4,191,785, Cl. 426-536.000.
Vinoskey, Adam V., to Simplimatic Engineering Company. Case opening apparatus. 4,191,005, Cl. 53-382.000.
Virag, Sandor: *See—*
Szekely, Istvan; Kovacs, Gabor; Virag, Sandor; and Szentivanyi, Matyas, 4,191,774, Cl. 424-300.000.
Vock, Manfred H.: *See—*
Schreiber, William L.; Siano, James N.; Vock, Manfred H.; and Shuster, Edward J., 4,191,660, Cl. 252-174.110.
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Voege, Clayton B. Garage door operator. 4,191,237, Cl. 160-188.000.
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Vogel, Alexander: *See—*
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Von Gunten, Lee. Automatic tracking apparatus. 4,191,084, Cl. 84-136.000.
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Connor, David T.; Ringel, Samuel M.; Roemer, Sidney; and von Strandtmann, Maximillian, 4,191,825, Cl. 542-430.000.
Vorbrueggen, Helmut: *See—*
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Vrba, James J., to GTE Automatic Electric Laboratories Incorporated. Data synchronization circuit. 4,191,849, Cl. 178-69.100.
Wacker-Chemie GmbH: *See—*
Kratel, Gunter; Stohr, Gunter; and Katzer, Hans, 4,191,587, Cl. 106-308.00Q.
Schiller, August; Louis, Eckhart; Bosch, Erhard; and Braunsperger, Karl, 4,191,817, Cl. 528-38.000.
Wadsworth, Craig D. Convertible couch. 4,190,911, Cl. 5-44.00R.
Wagner, Jack F.: *See—*
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Wahlstrom, Ake E. T., to AB Nordstroms Linbanor. Device for opening and closing cargo pocket bottom outlets for bulk cargo. 4,191,314, Cl. 222-506.000.
Walch, Robert L., Jr.; Carey, Van P.; and Thomas, Michael J., to General Motors Corporation. Thermostatic mixer valve. 4,191,172, Cl. 126-421.000.
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Braatz, Paul O.; Grinberg, Jan; Jacobson, Alexander D.; and Waldner, Michael, 4,191,454, Cl. 350-342.000.
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Walker, Wesley F., Jr., 4,191,861, Cl. 179-81.00B.
Walker, Jack L.; and Carrara, Walter G., to Environmental Research Institute of Michigan. Method of processing radar data from a rotating scene using a polar recording format. 4,191,957, Cl. 343-5.0PC.
Walker, Robert M., to British Steam Specialties Limited, The. Valve member for a non-return valve. 4,191,211, Cl. 137-512.150.
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Moyer, Charles E., Jr.; Keller, George E., II; Beisner, Robert W.; and Walker, Wellington E., 4,191,701, Cl. 260-450.000.
Walker, Wesley F., Jr., to Walker Equipment & Service Co. Telephone amplifier. 4,191,861, Cl. 179-81.00B.
Walto, Joseph J., to Toro Company, The. Cutting heads. 4,190,954, Cl. 30-347.000.
Wanamaker, Joseph L., to General Motors Corporation. Oxygen sensor signal processing circuit for a closed loop air/fuel mixture controller. 4,191,151, Cl. 123-119.0EC.
Wandel u. Goltermann GmbH & Co.: *See—*
Harzer, Peter, 4,191,930, Cl. 331-1.00A.
Wanek, Donald J.: *See—*
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Ward, John W.: *See—*
Light, Steven D.; and Ward, John W., 4,191,637, Cl. 208-139.000.
Warner Electric Brake & Clutch Company: *See—*
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Connor, David T.; Ringel, Samuel M.; Roemer, Sidney; and von Strandtmann, Maximillian, 4,191,825, Cl. 542-430.000.
Warner, Louis A. Plotter. 4,190,960, Cl. 33-1.0SD.
Warner, Paul L., Jr.; and Luber, Edward J., Jr., to Westwood Pharmaceuticals, Inc. Method for reducing immunological response. 4,191,766, Cl. 424-250.000.
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Clark, Richard E.; Skelton, John; and Davis, Robert B., 4,191,218, Cl. 139-383.00R.
Wason, Satish K.; and Mays, Robert K., to J. M. Huber Corporation. Amorphous precipitated siliceous pigments and methods for their production. 4,191,742, Cl. 424-49.000.
Wasserman, Norman: *See—*
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Watanabe, Yutaka; Yamagishi, Seiichi; and Toriumi, Shiro, to Minolta Camera Kabushiki Kaisha. Manual retrieving mechanism for microfiche reader apparatus or the like. 4,191,455, Cl. 353-27.00A.
Watson, James M.; and Johnson, Michael E., to Cosden Technology, Inc.,. Distillation apparatus. 4,191,614, Cl. 202-177.000.
Way, Terrance: *See—*
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Weatherhead Company, The: *See—*
Acker, Richard C., 4,191,408, Cl. 285-113.000.
Webasto-Werk W. Baier GmbH and Co.: *See—*
Jardin, Hans; Hirschberger, August; and Isleif, Karl-Heinz, 4,191,068, Cl. 74-625.000.
Webb, William M., to General Electric Company. Fluid supply system for a domestic appliance. 4,191,025, Cl. 62-135.000.
Weber, Hermann P. Casting process for plastic lenses. 4,191,717, Cl. 264-1.000.
Weber, Hermann P., to Techsight Corp. Coating composition. 4,191,804, Cl. 428-409.000.
Weber, Roy P., to Bell Telephone Laboratories, Incorporated. Data base communication call processing method. 4,191,860, Cl. 179-18.00B.
Webinger, George P., to Champion International Corporation. Carton blank and erected integral carton and cover. 4,191,323, Cl. 229-8.000.
Weedon, Hans J.: *See—*
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Week, Robert D.: *See—*
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Wegmann, Jacques; and Kirner, Hans D., to Rohner AG Pratteln. Process for the manufacture of concentrated formulations. 4,191,680, Cl. 260-42.000.
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Weibel, Michael K.: *See*—
Spina, Joseph; and Weibel, Michael K., 4,191,176, Cl. 128-1.00R.
Weirich, Walter; and Rosenberg, Harry, to Gewerkschaft Eisenhutte Westfalia. Hydraulic roof support control system. 4,191,498, Cl. 405-302.000.
Weiss, Martin J.: *See*—
Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-Mei L., 4,191,699, Cl. 260-448.20D.
Wendt, Michael E.; and Beaver, Danny D., to General Electric Company. Heat dissipating motor mounting arrangement. 4,191,245, Cl. 165-69.0C0.
Wenstrup, David L.: *See*—
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Werner, Rudiger: *See*—
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Western Electric Company, Incorporated: *See*—
Durr, Helmut E.; and Mock, George E., 4,191,339, Cl. 242-54.00R.
Westhues, Melchior: *See*—
Mayr, Anton; Stickl, Helmut; and Westhues, Melchior, 4,191,745, Cl. 424-90.000.
Westinghouse Electric Corp.: *See*—
Bedel, Denis E., 4,191,874, Cl. 200-339.000.
Brenner, William C.; and Sterrett, Charles C., 4,191,903, Cl. 310-213.000.
Coyle, Forrest E., 4,191,871, Cl. 200-159.00R.
Larson, Daniel A., 4,191,910, Cl. 315-51.000.
Page, Burford J.; and Westermann, Winfried N., 4,191,989, Cl. 362-220.000.
Phillips, David C.; and Garbuny, Max, 4,191,622, Cl. 204-159.220.
Rogoff, Gerald L., 4,191,907, Cl. 313-204.000.
Shirland, Fred A.; and Biter, William J., 4,191,794, Cl. 427-74.000.
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Warner, Paul L., Jr.; and Luber, Edward J., Jr., 4,191,766, Cl. 424-250.000.
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Wettlaufer, Dale E., to Terrier Machine Corporation. Apparatus for extracting juice from pomace. 4,191,103, Cl. 100-110.000.
Weyerhaeuser Company: *See*—
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White, Arthur K.: *See*—
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White, Hugh E.; and Petri, Robert J., to RCA Corporation. Digital phase synchronizing system. 4,191,975, Cl. 358-264.000.
White, James E.: *See*—
Alley, Lewis F.; and White, James E., 4,191,309, Cl. 222-1.000.
White, Maxwell A.: *See*—
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Whitmore, Edward A., to Envirotech Corporation. Apparatus for filter backwashing. 4,191,652, Cl. 210-274.000.
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Wick, Alexander E.: *See*—
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Wickenberg, Chester H., to Transco Inc. End fitting for cargo containers. 4,191,109, Cl. 410-149.000.
Wiesman, Dale C., to American Can Company. Non-blocking coating composition. 4,191,673, Cl. 260-29.6XA.
Wiezer, Hartmut; Pfahler, Gerhard; Mayer, Norbert; and Knorr, Harald, to Hoechst Aktiengesellschaft. Urea derivatives, their preparation, and their use as light stabilizers. 4,191,684, Cl. 260-48.5NT.
Wikel, James H.: *See*—
Su, Kenneth S.; Templeton, Robert J.; and Wikel, James H., 4,191,832, Cl. 548-306.000.
Wilcox, Brian N.; Schroeder, Melvin J.; Whittington, Billy J.; and Robinson, John W., to Kimball International, Inc. Method and apparatus for memorizing an accompaniment passage. 4,191,083, Cl. 84-1.280.
Wildi, Leo J., to Securiweb Limited. Separable buckle. 4,190,934, Cl. 24-77.00R.
Wildman, John R.: *See*—
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Wilem, Richard T.: *See*—
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Willetts, Elwood H. Vehicle suspension system. 4,191,398, Cl. 280-683.000.
Williams, Fred G., Jr.: *See*—
Mullerheim, Steven B.; and Williams, Fred G., Jr., 4,191,647, Cl. 210-128.000.
Williams, Hugh K., to Allis-Chalmers Corporation. Seal and sound attenuator for control console. 4,191,273, Cl. 180-89.130.
Williams, John A., to United Kingdom Atomic Energy Authority. Chemical plant. 4,191,022, Cl. 62-55.500.
Williams, Malcolm; Tingey, Albert R.; Southgate, John P.; and Russell, Steven J., to Lucas Industries Limited. Electronic fuel injection control for an internal combustion engine. 4,191,137, Cl. 123-32.0EH.
Williams, Reginald T.: *See*—
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Willis, Kirk: *See*—
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Wilson, Clifford A., to Rotocrop International, Ltd. Apparatus for breaking up vegetable matter. 4,191,337, Cl. 241-224.000.
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Winberg, Torbjorn: *See*—
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Winchell, David A.; Martin, Jerry D.; and Roe, Frank L., to Baxter Travenol Laboratories, Inc. Flexible collapsible containers, and method of molding. 4,191,231, Cl. 150-8.000.
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Brennan, Timothy E., 4,191,241, Cl. 165-10.000.
Wismer, Marco; and Bosso, Joseph F., to PPG Industries, Inc. Zwitterion-containing compositions. 4,191,674, Cl. 260-29.2EP.
Wisnieski, Michael J. Massage device. 4,191,178, Cl. 128-57.000.
Withycombe, Donald A.; Mookherjee, Braja D.; Vock, Manfred H.; and Vinals, Joaquin F., to International Flavors & Fragrances Inc. Flavoring with mixtures of 2,4,6-triisobutyl-1,3,5-trioxane and 2-isobutyl-dialkyl oxazolines. 4,191,785, Cl. 426-536.000.
Witsenhausen, Hans S.; and Wyner, Aaron D., to Bell Telephone Laboratories, Incorporated. Interframe coder for video signals. 4,191,970, Cl. 358-167.000.
Wittenbrook, Lawrence S.: *See*—
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Wolf, Franz-Josef; and Roth, Dieter, to WOCO Franz-Josef Wolf & Co. Gasket ring with locking rings. 4,191,390, Cl. 277-219.000.
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Wood, William P.; and Jutila, Raymond E., to Magnetic Peripherals Inc. Magnetic transducing head with a turn in the gap. 4,191,982, Cl. 360-123.000.
Woodard, Tony O., to Eaton Corporation. Illuminated sealed rocker switch. 4,191,873, Cl. 200-302.000.
Woode, Alan D., to Microwave and Electronic System Limited. Intrusion sensor and aerial therefor. 4,191,953, Cl. 340-552.000.
Woog, Heinrich; and Gruber, Werner, to Boehringer Mannheim GmbH. Instillation composition. 4,191,772, Cl. 424-273.00R.
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Wozniak, Walter J.: *See*—
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Wren, Fred H., Jr.; and Babcock, Frank H., III, to Pro-tect, Inc. Karate foot protector. 4,190,971, Cl. 36-106.000.
Wright, Basil M., to National Research Development Corporation. Medical apparatus. 4,191,187, Cl. 128-218.00A.
Wright, Peter A., to Gulf Chemical & Metallurgical Co. Method of extracting a metal from a melt containing the metal. 4,191,560, Cl. 75-85.000.
Wu, Che-Kuang, to Corning Glass Works. Method of making photosensitive colored glasses exhibiting alterable photo-anisotropic effects. 4,191,547, Cl. 65-30.00R.
Wu, Chester C.; and Garner, Albert Y., to Monsanto Company. Flame retarding compound. 4,191,715, Cl. 260-927.00N.
Wyner, Aaron D.: *See*—
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Nakajima, Kunihiko; Sato, Kyoshi; Iio, Toshimitsu; and Kanda, Atsushi, 4,191,866, Cl. 200-4.000.
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Yamamura, Yuichi; Azuma, Ichiro; Sugimura, Kazuhisa; Morimoto, Hiroshi; Imada, Isuke; and Watanabe, Masazumi, to Takeda Chemical Industries, Ltd. Aqueous immunoregulatory agent. 4,191,778, Cl. 424-317.000.
Yamashita, Ryuichi; and Matsumoto, Hiromitsu, to Yamaha Hatsudoki Kabushiki Kaisha. Carburetor for internal combustion engines. 4,191,716, Cl. 261-23.00A.
Yamazaki, Katsuo: *See*—
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Yamazaki, Yoshiaki: *See*—
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Yanagisawa, Syozo; and Ishikawa, Shigewo, to Hitachi, Ltd. Pressure responsive switch having protection from overpressure of source. 4,191,870, Cl. 200-83.00P.
Yanagita, Shuichi: *See*—
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Yang, Ralph T.; and Shen, Ming-shing, to United States of America, Energy. Carbonaceous fuel combustion with improved desulfurization. 4,191,115, Cl. 110-347.000.
Yano, Douglas H.: *See*—
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Yano, Osahiko: *See*—
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Yarrow, Christopher J., to Lucas Industries Limited. Rotary electric machines. 4,191,902, Cl. 310-68.00D.
Yasuda, Yuh; Kizaki, Sigeru; and Miya, Yukio, to Citizen Watch Company Limited. Sealed housings for a subminiature piezoelectric vibrator. 4,191,905, Cl. 310-344.000.
Yates, Vincent A.: *See*—
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Yllo, Walter: *See*—
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Yonezawa, Kazuya; Kato, Yasushi; Furkawa, Hisao; and Azuma, Masaaki, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Room temperature curable composition. 4,191,713, Cl. 525-102.000.
Yonezawa, Kazuya; Kato, Yasushi; Furukawa, Hisao; and Azuma, Masaaki, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Curable polyester oligomer and a process for producing same. 4,191,714, Cl. 525-102.000.
Yoshida, Hiroshi; and Akashi, Shunji, to Yoshida Kogyo K.K. Method of manufacturing slide fasteners. 4,190,944, Cl. 29-408.000.
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Yoshida, Hiroshi; and Akashi, Shunji, 4,190,944, Cl. 29-408.000.
Yoshida, Hiroshi; and Akashi, Shunji, 4,190,945, Cl. 29-408.000.
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Yoshikazu, Nakajima; Kazumasa, Suzuki; and Tsuyoshi, Makino, to Mitsui Sugar Co., Ltd. Process for the production of immobilized glucose isomerase. 4,191,810, Cl. 435-177.000.
Yoshimura, Hirofumi: *See*—
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Yoshino, Hironori, to Matsushita Electric Industrial Co. Ltd. Corona discharge detection apparatus which eliminates periodic noise. 4,191,921, Cl. 324-54.000.
Young, Donald C.; and Fleck, Raymond N., to Union Oil Company of California. Electrochemical conversion of sulfur-containing anions to sulfur. 4,191,620, Cl. 204-149.000.
Young, Rodney C.: *See*—
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Yuuki, Kiyoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. EGR/Ignition timing control system for an internal combustion engine. 4,191,143, Cl. 123-117.00A.
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Bender, Hans; Schnabel, Georg; Duren, Gottfried; and Zabel, Wolf, 4,191,591, Cl. 134-25.00R.
Zahnradfabrik Friedrichshafen AG: *See*—
Ehrlinger, Friedrich J.; and Bock, Horst, 4,191,072, Cl. 74-732.000.
Zaripov, Raif R.: *See*—
Stepantsov, Georgy K.; Abramov, Valentin S.; Bloschitsyn, Jury N.; and Zaripov, Raif R., 4,191,045, Cl. 72-407.000.
Zasio, John J.; and Samuels, Michael W., to Fujitsu Limited. Table positioning system including optical reference position measuring transducer. 4,191,916, Cl. 318-640.000.
Zedrosser, Ulrich, to Steyr-Daimler-Puch-Aktiengesellschaft. Breech-closing mechanism for automatic rifle. 4,191,089, Cl. 89-181.000.
Zenith Radio Corporation: *See*—
Dougherty, Lawrence W., 4,191,909, Cl. 313-402.000.
Szydlowski, William J., 4,191,973, Cl. 358-245.000.
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Liepmann, Hans; Hueschens, Rolf; Milkowski, Wolfgang; Zeugner, Horst; Heinemann, Henning; Wolf, Klaus-Ullrich; Hell, Insa; and Hempel, Reinhard, 4,191,770, Cl. 424-266.000.
Zeuner, Kenneth W.; and Jarman, Alonzo B., to Control Concepts, Inc. Feathering valve assembly. 4,191,091, Cl. 91-52.000.
Zimmer, Elvis S.: *See*—
Ahlgren, David W.; Hassell, David A.; and Zimmer, Elvis S., 4,191,881, Cl. 219-388.000.
Zimmerman, Dennis M., to Eli Lilly and Company. Analgesic method using 1,3,4-trisubstituted-4-arylpiperidines. 4,191,771, Cl. 424-267.000.
Zingher, Arthur R. Bi-directional optical apparatus for altering an optically projected member. 4,191,457, Cl. 353-44.000.
Zippel, Herbert, to Herbert Zippel GmbH & Co., KG. Document files. 4,191,484, Cl. 402-15.000.
Zographos, Georgios: *See*—
Jeanneret, Remy; Zwahlen, Gunther; Frey, Christoph; and Zographos, Georgios, 4,191,566, Cl. 430-31.000.
Zupancic, Franc: *See*—
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Zupancic, Viktor; Zupancic, Franc; and Zupancic, Tomaz. Mixing apparatus for concrete or other bulk material. 4,191,478, Cl. 366-39.000.
Zwahlen, Gunther: *See*—
Jeanneret, Remy; Zwahlen, Gunther; Frey, Christoph; and Zographos, Georgios, 4,191,566, Cl. 430-31.000.

LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 4TH DAY OF MARCH, 1980

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Donovan, Leonard D.; and Sitter, Matthew M. Preformed hot-melt sealant strip. T991,001, 3-4-80, Cl. 428-40.000.

Leonard, Don R. Coating composition. T991,002, 3-4-80, Cl. 260-15.000.

Sitter, Matthew M.: *See*—
Donovan, Leonard D.; and Sitter, Matthew M., T991,001, Cl. 428-40.000.

LIST OF REISSUE PATENTEES

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Horner, Raymond L.: *See*—
Prescott, David B.; Thumm, Herbert H.; and Horner, Raymond L., Re. 30,223, Cl. 277-37.000.

Mechanex Corporation, The: *See*—
Prescott, David B.; Thumm, Herbert H.; and Horner, Raymond L., Re. 30,223, Cl. 277-37.000.

Prescott, David B.; Thumm, Herbert H.; and Horner, Raymond L., to Mechanex Corporation, The. Lubricant seal. Re. 30,223, Cl. 277-37.000.

Thumm, Herbert H.: *See*—
Prescott, David B.; Thumm, Herbert H.; and Horner, Raymond L., Re. 30,223, Cl. 277-37.000.

LIST OF PLANT PATENTEES

Bringhurst, Royce S.; and Voth, Victor, to University of California, The Regents of the. CN7 Strawberry plant. 4,507, 3-4-80, Cl. 49.000.

University of California, The Regents of the: *See*—
Bringhurst, Royce S.; and Voth, Victor, 4,507, Cl. 49.000.

Voth, Victor: *See*—
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Zaiger, Chris F. Peach tree. 4,508, 3-4-80, Cl. 43.000.

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Aktiebolaget Electrolux: *See*—
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Arnsteiner, Anton, to Blizzard Gesellschaft m.b.H. Ski. 254,385, 3-4-80, Cl. D21-229.000.

Arvin Industries, Inc.: *See*—
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Babcock, Joe J. Saddle bags. 254,343, 3-4-80, Cl. D3-79.000.

Barn and Silo Stores Inc.: *See*—
Cooper, Howard, 254,392, Cl. D25-14.000.

Blizzard Gesellschaft m.b.H.: *See*—
Arnsteiner, Anton, 254,385, Cl. D21-229.000.

Boudrot, Richard L.; Hall, William R.; and Weaver, Allan E., to Digital Equipment Corporation. Data processing system console. 254,371, 3-4-80, Cl. D14-42.000.

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Carlsson, Karl L., to Aktiebolaget Electrolux. Power unit for kitchen appliances. 254,356, 3-4-80, Cl. D7-153.000.

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Chicago Tool and Engineering Company: *See*—
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Cone, Richard E., to Questor Corporation. Combined plant trellis and window guard. 254,393, 3-4-80, Cl. D25-53.000.

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Czerefkow, Germaine. Pair of spectacles. 254,377, 3-4-80, Cl. D16-65.000.

Dickey, Avis M., to Dickey, Inc. Font of illustration figures for children's stories and cards. 254,379, 3-4-80, Cl. D18-33.000.

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Digital Equipment Corporation: *See*—
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Ekuan, Kenji, to Yamaha Hatsudoki Kabushiki Kaisha. Motortricycle. 254,366, 3-4-80, Cl. D12-110.000.

Fehn, Gregory M., to Owens-Illinois Inc. Bottle. 254,357, 3-4-80, Cl. D9-10.000.
Fetty, Harold D.; Martin, William F.; Tatum, Gary A.; and Worley, Lyle L., to Goodyear Tire & Rubber Company, The. Tire. 254,369, 3-4-80, Cl. D12-142.000.
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Kamiya, Tadashi, to Bridgestone Tire Company Limited. Vehicle tire. 254,367, 3-4-80, Cl. D12-136.000.
Kawano, Takeyoshi, to Matsushita Electric Industrial Co., Ltd. Radio receiver. 254,374, 3-4-80, Cl. D14-70.000.
Kiss, Alexander S.: *See*—
Leslie, Frank B.; and Kiss, Alexander S., 254,394, Cl. D25-64.000.
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Martin, William F.: *See*—
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Miller, Timothy A.; and Hansen, Carlo J., to Ralston Purina Company. Animal food product. 254,339, 3-4-80, Cl. D1-27.000.
Minassian, Gary E. Bracelet or similar article. 254,362, 3-4-80, Cl. D11-14.000.
Moll, Jack E., to Miller Tilt-Top Trailer, Inc. Trailer loading ramp. 254,364, 3-4-80, Cl. D12-53.000.
Montecalvo, Lawrence G. Room heat recirculator. 254,391, 3-4-80, Cl. D23-151.000.
Ogden, Philip I. Whirlpool bathtub. 254,387, 3-4-80, Cl. D23-55.000.
Ohta, Kikuo, to Matsushita Electric Industrial Co., Ltd. Motor vehicular citizens' band transceiver. 254,373, 3-4-80, Cl. D14-68.000.
Ottier, Sharon. Dish. 254,355, 3-4-80, Cl. D7-20.000.
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Pitney Bowes Inc.: *See*—
Sinn, Hans J.; Weirsman, William A.; and Woods, George H., 254,372, Cl. D14-48.000.
Pitts, Earl L. Popcorn dispenser. 254,361, 3-4-80, Cl. D9-224.000.
Poliquin, Richard D. Combined cue protector and tip scuffer. 254,383, 3-4-80, Cl. D21-210.000.
Price, John F.: *See*—
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Seda, Theodore P., to L. D. Schreiber Cheese Co., Inc. Packaging container for a sliced food product or the like. 254,358, 3-4-80, Cl. D9-192.000.
Seda, Theodore P., to L. D. Schreiber Cheese Co., Inc. Packaging container for a sliced food product or the like. 254,359, 3-4-80, Cl. D9-192.000.
Seda, Theodore P., to L. D. Schreiber Cheese Co., Inc. Packaging container for a sliced food product or the like. 254,360, 3-4-80, Cl. D9-192.000.
Simmons, Gregory L. Upholstered chair or the like. 254,344, 3-4-80, Cl. D6-26.000.
Sinn, Hans J.; Weirsman, William A.; and Woods, George H., to Pitney Bowes Inc. Collating machine. 254,372, 3-4-80, Cl. D14-48.000.
Smajd, Carl F., to Uniroyal, Inc. Pneumatic tire tread and buttress. 254,368, 3-4-80, Cl. D12-141.000.
Smith, William T. Fireplace unit. 254,390, 3-4-80, Cl. D23-97.000.
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Storm, William D., to Storm Plastics, Inc. Fishing lure. 254,386, 3-4-80, Cl. D22-28.000.
Sunset, Philip C. Cold storage food drawer for a boat or the like. 254,342, 3-4-80, Cl. D3-78.000.
Suzuki, Toshio, to Tomy Kogyo Co., Inc. Toy robot hand. 254,382, 3-4-80, Cl. D21-189.000.
Tatum, Gary A.: *See*—
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Thomas, Richard F. Toy coaster. 254,380, 3-4-80, Cl. D21-76.000.
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Weaver, Allan E.: *See*—
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Weinstein, Barnet; and Price, John F., to Weinstein, Barnet. Modular control panel. 254,370, 3-4-80, Cl. D13-12.000.
Weirsman, William A.: *See*—
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Whitesel, John A., II. Electric guitar. 254,378, 3-4-80, Cl. D17-18.000.
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Worley, Lyle L.: *See*—
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Yamaha Hatsudoki Kabushiki Kaisha: *See*—
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CLASSIFICATION OF PATENTS

ISSUED MARCH 4, 1980

NOTE.—First number, class; second number, subclass; third number, patent number

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4 R	4,191,107

CLASS 106

1.12	4,191,577
1.13	4,191,578
15 R	4,191,579
16	4,191,580
20	4,191,581
38.2	4,191,582
39.6	4,191,583
90	4,191,584
99	4,191,585
100	4,191,586
308 Q	4,191,587

CLASS 108

27	4,191,110
53.3	4,191,112
132	4,191,111
157	4,191,113

CLASS 110

248	4,191,114
347	4,191,115

CLASS 111

4	4,191,116

CLASS 112

2	4,191,117
121.11	4,191,118
158 B	4,191,121
158 E	4,191,120
158 R	4,191,119
261	4,191,122

CLASS 113

116 H	4,191,123

CLASS 114

123	4,191,124

CLASS 116

219	4,191,125

CLASS 118

50	4,191,126
57	4,191,127
720	4,191,128

CLASS 119

5	4,191,129
22	4,191,130
155	4,191,131

CLASS 122

156	4,191,132
235 R	4,191,133

CLASS 123

25 J	4,191,134
30 C	4,191,135
	4,191,136
32 EH	4,191,137
48 A	4,191,139
52 MB	4,191,140
65 A	4,191,141
73 R	4,191,138
90.58	4,191,142
117 A	4,191,143
	4,191,145
	4,191,147
117 R	4,191,144
	4,191,146
119 B	4,191,150
119 C	4,191,152
119 CD	4,191,148
119 EC	4,191,149
	4,191,151
133	4,191,153
136	4,191,154
148 P	4,191,155
193 C	4,191,156
198 R	4,191,157

CLASS 124

76	4,191,158

CLASS 125

21	4,191,159

CLASS 126

9 R	4,191,160
121	4,191,161
123	4,191,162
132	4,191,163
292	4,191,171
350 R	4,191,173
417	4,191,167
421	4,191,172
427	4,191,329
430	4,191,166
439	4,191,164
441	4,191,168
444	4,191,169
445	4,191,165
449	4,191,170

CLASS 128

1 B	4,191,174
1 C	4,191,175
1 R	4,191,176
51	4,191,177
57	4,191,178
58	4,191,179
207.17	4,191,180
213 R	4,191,181
214 F	4,191,184
214 R	4,191,182
	4,191,183
214.4	4,191,185
	4,191,186
218 A	4,191,187
303.13	4,191,188
328	4,191,189
330	4,191,190
347	4,191,191
457	4,191,192
675	4,191,193
692	4,191,194
696	4,191,195
733	4,191,196
736	4,191,197

CLASS 131

76	4,191,198
96	4,191,199

CLASS 132

123	4,191,200

CLASS 134

2	4,191,588
21	4,191,589
	4,191,590
25 R	4,191,591
48	4,191,592
104	4,191,201

CLASS 136

89 CA	4,191,593
89 PC	4,191,594

CLASS 137

112	4,191,202
	4,191,203
205	4,191,204
344	4,191,206
	4,191,207
375	4,191,205
393	4,191,208
486	4,191,209
505.13	4,191,210
512.15	4,191,211
601	4,191,212
625.17	4,191,213
630.2	4,191,214
870	4,191,215

CLASS 138

44	4,191,216
109	4,191,217

CLASS 139

383 R	4,191,218
	4,191,219
384 B	4,191,220
426 R	4,191,221
453	4,191,222

CLASS 141

18	4,191,223
100	4,191,224
329	4,191,225
391	4,191,226

CLASS 145

46	4,191,227
50 A	4,191,228

CLASS 148

1.5	4,191,595
6.27	4,191,596
12 B	4,191,597
16.5	4,191,598
	4,191,599
142	4,191,600
160	4,191,601
171	4,191,602
187	4,191,603

CLASS 150

1	4,191,229
3	4,191,230
8	4,191,231
12	4,191,232
52 R	4,191,233
	4,191,234

CLASS 151

55	4,191,235
69	4,191,236

CLASS 156

245	4,191,604
285	4,191,605
288	4,191,606
384	4,191,607
584	4,191,608

CLASS 160

188 4,191,237

CLASS 162

113 4,191,609
147 4,191,610
273 4,191,611
352 4,191,612

CLASS 164

100 4,191,238
200 4,191,239

CLASS 165

1 4,191,240
10 4,191,241
11 4,191,242
45 4,191,243
69 4,191,244
4,191,245
134 R 4,191,246
158 4,191,247

CLASS 166

65 M 4,191,248
244 C 4,191,249
253 4,191,250
260 4,191,251
272 4,191,252
275 4,191,253
286 4,191,254
297 4,191,255
343 4,191,256

CLASS 169

90 4,191,257

CLASS 172

40 4,191,258
43 4,191,259
311 4,191,260
371 4,191,261
459 4,191,262

CLASS 173

28 4,191,263
93.6 4,191,264

CLASS 175

4.56 4,191,265
17 4,191,266
53 4,191,267

CLASS 177

210 C 4,191,268

CLASS 178

3 4,191,847
4.1 R 4,191,848
69.1 4,191,849

CLASS 179

1 G 4,191,852
1 GD 4,191,850
4,191,851
1 SA 4,191,853
2 A 4,191,855
2 R 4,191,854
15 A 4,191,856
15 BY 4,191,857
15.55 4,191,858
18 B 4,191,860
18 FA 4,191,859
81 B 4,191,861
84 VF 4,191,862
115.5 R 4,191,863
175.1 A 4,191,864
178 4,191,865

CLASS 180

27 4,191,269
53 D 4,191,270
77 TC 4,191,271
84 4,191,272
89.13 4,191,273
282 4,191,274

CLASS 182

3 4,191,275

CLASS 187

9 E 4,191,276
29 R 4,191,277

CLASS 188

73.3 4,191,278
82.84 4,191,279
300 4,191,280
319 4,191,281

CLASS 192

0.034 4,191,282
26 4,191,283
85 AA 4,191,284
111 A 4,191,285

CLASS 193

40 4,191,286

CLASS 198

472 4,191,287

CLASS 200

4 4,191,866
16 R 4,191,867
61.45 R 4,191,869
61.5 4,191,868
83 P 4,191,870
159 R 4,191,871
296 4,191,872
302 4,191,873
339 4,191,874

CLASS 202

177 4,191,614

CLASS 203

3 4,191,615
44 4,191,616

CLASS 204

40 4,191,617
98 4,191,618
104 4,191,619
149 4,191,620
158 HA 4,191,621
159.22 4,191,622
180 R 4,191,623
181 T 4,191,624
197 4,191,625
266 4,191,626
296 4,191,627

CLASS 206

45.14 4,191,289
45.22 4,191,288
150 4,191,290
369 4,191,291
387 4,191,292
467 4,191,293

CLASS 208

8 R 4,191,628
10 4,191,629
11 R 4,191,630
33 4,191,631
65 4,191,633
4,191,634
89 4,191,635
110 4,191,636
139 4,191,637
4,191,638
309 4,191,639
348 4,191,640

CLASS 209

135 4,191,294
166 4,191,641
495 4,191,642

CLASS 210

4 4,191,643
33 4,191,644
47 4,191,645
103 4,191,646
128 4,191,647
186 4,191,648
198 C 4,191,649
242 S 4,191,650
265 4,191,651
274 4,191,652
396 4,191,653
451 4,191,654

CLASS 211

41 4,191,295
49 D 4,191,296
83 4,191,297
126 4,191,298
184 4,191,299

CLASS 212

41 4,191,300
69 4,191,301

CLASS 219

10.49 R 4,191,875
10.55 B 4,191,876
4,191,877
69 E 4,191,878
358 4,191,879
375 4,191,880
388 4,191,881

CLASS 220

1 R 4,191,302
222 4,191,303
414 4,191,304
462 4,191,305

CLASS 221

33 4,191,306
45 4,191,307
202 4,191,308

CLASS 222

1 4,191,309
5 4,191,310
142.6 4,191,311
142.9 4,191,312
335 4,191,313
506 4,191,314
553 4,191,315

CLASS 224

42.03 B 4,191,316

CLASS 225

77 4,191,317
103 4,191,318

CLASS 228

147 4,191,319

CLASS 229

3.5 R 4,191,320
5.5 4,191,321
5.8 4,191,322
8 4,191,323
22 4,191,324

CLASS 233

20 A 4,191,325

CLASS 236

1 G 4,191,326
42 4,191,327
46 R 4,191,328

CLASS 239

66 4,191,330
231 4,191,331
428.5 4,191,332
543 4,191,333

CLASS 241

17 4,191,335
21 4,191,336
224 4,191,337
245 4,191,338

CLASS 242

54 R 4,191,339
4,191,340
56 A 4,191,341
68 4,191,342
84.21 R 4,191,343
107 4,191,344
197 4,191,345

CLASS 244

3.16 4,191,346
76 A 4,191,347
134 C 4,191,348
145 4,191,349

CLASS 248

293 4,191,350
311.1 R 4,191,351
317 4,191,352
425 4,191,353
445 4,191,354
594 4,191,355
678 4,191,356

CLASS 249

205 4,191,357

CLASS 250

201 4,191,882
259 4,191,883
270 4,191,884
302 4,191,885
376 4,191,886
396 ML 4,191,887
396 R 4,191,888
402 4,191,889
4,191,890
4,191,891
445 T 4,191,892

CLASS 251

5 4,191,358
9 4,191,359

CLASS 252

8.55 C 4,191,657
8.6 4,191,656
32.7 E 4,191,658
45 4,191,659
60 4,191,655
103 4,191,661
174.11 4,191,660
301.4 R 4,191,662
455 Z 4,191,663
466 J 4,191,664
520 4,191,665
545 4,191,666

CLASS 254

129 4,191,360

CLASS 256

12.5 4,191,361

CLASS 260

2.3 4,191,667
6 4,191,668
18 N 4,191,669
23 AR 4,191,670
23.7 M 4,191,671
29.2 EP 4,191,674
29.3 4,191,675
29.6 PM 4,191,672
29.6 XA 4,191,673
29.7 R 4,191,676
37 EP 4,191,677
40 R 4,191,678
4,191,679
42 4,191,680
45.7 P 4,191,681
45.8 N 4,191,682
4,191,683
45.95 G 4,191,685
48.5 NT 4,191,684
147 4,191,686
153 4,191,687
244.4 4,191,688
343.3 R 4,191,690
345.2 4,191,691
345.5 4,191,692
345.9 R 4,191,693
346.22 4,191,694
346.76 4,191,695
348.33 4,191,696
397.5 4,191,697
429.7 4,191,698
448.2 D 4,191,699
449 M 4,191,700
450 4,191,701
453 RY 4,191,702
458 C 4,191,703
459 R 4,191,704
463 4,191,705
559 A 4,191,706
570.5 CA 4,191,707
582 4,191,708
583 R 4,191,709
601 R 4,191,710
650 R 4,191,711
654 D 4,191,712
927 N 4,191,715

CLASS 261

23 A 4,191,716

CLASS 264

1 4,191,717
26 4,191,718
41 4,191,719
43 4,191,720
4,191,721
45.5 4,191,722
129 4,191,723
255 4,191,724
261 4,191,725
517 4,191,726

CLASS 266

48 4,191,362
129 4,191,363
246 4,191,364

CLASS 269

46 4,191,365
47 4,191,366
203 4,191,367

CLASS 271

10 4,191,368
299 4,191,369

CLASS 272

111 4,191,371
120 4,191,370

CLASS 273

29 A 4,191,372
4,191,373
30 4,191,374
65 EB 4,191,375
139 4,191,376
143 R 4,191,377
162 R 4,191,378
258 4,191,379

CLASS 274

9 B 4,191,380
4,191,381
15 R 4,191,382

CLASS 277

1 4,191,383
4,191,384
3 4,191,385
22 4,191,386
30 4,191,387
37 Re.30,223
166 4,191,389
219 4,191,390

CLASS 280

9 4,191,391
166 4,191,388
289 A 4,191,393
432 4,191,394
613 4,191,395
615 4,191,396
647 4,191,397
683 4,191,398
740 4,191,392
796 4,191,401
806 4,191,399
808 4,191,400

CLASS 282

23 R 4,191,402
27.5 4,191,403
4,191,404
28 A 4,191,405

CLASS 285

35 4,191,406
56 4,191,407
113 4,191,408
189 4,191,409
367 4,191,410

CLASS 290

53 4,191,893

CLASS 292

87 4,191,411
182 4,191,412
262 4,191,413

CLASS 294

1 BA 4,191,414
67 R 4,191,415
74 4,191,416

CLASS 296

65 R 4,191,417
163 4,191,418

CLASS 297

48 4,191,419
194 4,191,420
391 4,191,422
408 4,191,423
459 4,191,424
483 4,191,421

CLASS 299

5 4,191,425
39 4,191,426

CLASS 301

108 S 4,191,427

CLASS 303

6 M 4,191,428
58 4,191,429
109 4,191,430

CLASS 305

18 4,191,431

CLASS 307

116 4,191,894
221 D 4,191,895
4,191,896
234 4,191,897
264 4,191,898
303 4,191,899
355 4,191,900

CLASS 308

187 4,191,432

CLASS 310

11 4,191,901
68 D 4,191,902
213 4,191,903
322 4,191,904
344 4,191,905
370 4,191,906

CLASS 312

183 4,191,433
214 4,191,434
266 4,191,435
293 4,191,436
305 4,191,437
306 4,191,438
330 R 4,191,439

CLASS 313

204 4,191,907
325 4,191,908
402 4,191,909

CLASS 315

51 4,191,910
209 R 4,191,911
4,191,912

CLASS 318

139 4,191,914
464 4,191,915
563 4,191,913
640 4,191,916

CLASS 320

2 4,191,917
23 4,191,918

CLASS 324

54 4,191,921
225 4,191,922
312 4,191,919
459 4,191,920

CLASS 325

4 4,191,923
465 4,191,924
474 4,191,925
476 4,191,926

CLASS 328

157 4,191,927

CLASS 330

4.3 4,191,928
10 4,191,929

CLASS 331

1 A 4,191,930
94.5 Q 4,191,931
111 4,191,932

CLASS 333

151 4,191,933
155 4,191,934

CLASS 335

154 4,191,935
210 4,191,936
230 4,191,937

CLASS 338

195 4,191,938

CLASS 339

17 C 4,191,440
17 F 4,191,441
99 R 4,191,442
103 R 4,191,443
107 4,191,444
252 R 4,191,445

CLASS 340

107 4,191,939
146.3 B 4,191,940
166 R 4,191,941
347 AD 4,191,942
378.2 4,191,943
388 4,191,944
407 4,191,945
506 4,191,946
531 4,191,947
539 4,191,948
552 4,191,953
573 4,191,949
604 4,191,950
610 4,191,951
611 4,191,952
679 4,191,954
753 4,191,955
789 4,191,956

CLASS 343

5 PC 4,191,957
105 R 4,191,958
700 MS 4,191,959
854 4,191,960

CLASS 346

74.1 4,191,961
110 R 4,191,962

CLASS 350

96.15 4,191,446
96.20 4,191,447
96.23 4,191,448
97 4,191,449
121 4,191,450
126 4,191,451
342 4,191,452
4,191,454
357 4,191,453

CLASS 353

27 A 4,191,455
31 4,191,456
44 4,191,457

CLASS 354

23 D 4,191,458
4,191,459
25 4,191,460
64 4,191,461
139 4,191,462
217 4,191,463
246 4,191,464

CLASS 355

3 SH 4,191,465
35 4,191,466

75 4,191,467

CLASS 356

17 4,191,468
23 4,191,469
35.5 4,191,470
154 4,191,471
243 4,191,472
300 4,191,473
305 4,191,474
318 4,191,475
349 4,191,476
373 4,191,477

CLASS 357

23 4,191,963
51 4,191,964

CLASS 358

10 4,191,965
86 4,191,966
113 4,191,967
141 4,191,968
145 4,191,969
167 4,191,970
210 4,191,971
214 4,191,972
245 4,191,973
261 4,191,974
264 4,191,975

CLASS 360

51 4,191,976
66 4,191,977
75 4,191,978
85 4,191,979
99 4,191,980
4,191,981
123 4,191,982
125 4,191,983
132 4,191,984

CLASS 361

56 4,191,985
38 4,191,986
124 4,191,987

CLASS 362

72 4,191,988
220 4,191,989
276 4,191,990
319 4,191,991

CLASS 363

50 4,191,992
135 4,191,993
4,191,994

CLASS 364

113 4,191,995
200 4,191,996
4,191,997
4,191,998
405 4,191,999
415 4,192,000
418 4,192,001
449 4,192,002
487 4,192,003
518 4,192,004
571 4,192,005
715 4,192,006
721 4,192,007
724 4,192,008
829 4,192,009
900 4,192,010

CLASS 365

2 4,192,011
87 4,192,012
91 4,192,013
104 4,192,014
114 4,192,015
163 4,192,016

CLASS 366

39 4,191,478
101 4,191,479
336 4,191,480

CLASS 400

87 4,191,481
207 4,191,482
369 4,191,483

CLASS 402

15 4,191,484

CLASS 403

4,191,485
28 4,191,486
337 4,191,487
370 4,191,488

CLASS 404

51 4,191,489
70 4,191,490

CLASS 405

52 4,191,491
133 4,191,492
150 4,191,493
171 4,191,494
195 4,191,495
229 4,191,496
296 4,191,497
302 4,191,498

CLASS 406

34 4,191,499
146 4,191,500

CLASS 409

104 4,191,501

CLASS 410

110 4,191,108
149 4,191,109

CLASS 414

140 4,191,502
401 4,191,503

CLASS 415

1 4,191,504
2 4,191,505

CLASS 416

91 4,191,506
117 4,191,507
196 R 4,191,508
219 R 4,191,509
230 4,191,510

CLASS 417

18 4,191,511
54 4,191,512
517 4,191,513
529 4,191,514

CLASS 418

61 R 4,191,515

CLASS 423

1 4,191,727
24 4,191,728
98 4,191,729
239 4,191,730
242 4,191,731
243 4,191,732
245 4,191,733
320 4,191,734
446 4,191,735
482 4,191,736
630 4,191,737

CLASS 424

1 4,191,738
12 4,191,739
14 4,191,740
19 4,191,741
28 4,191,743
49 4,191,742
78 4,191,744
90 4,191,745
92 4,191,746
94 4,191,747
4,191,748
105 4,191,749
127 4,191,750
177 4,191,751
4,191,752
4,191,753
4,191,754
180 4,191,755
4,191,756
225 4,191,757
229 4,191,758
242 4,191,759
244 4,191,760
245 4,191,761
246 4,191,762
4,191,763
248.53 4,191,765
248.55 4,191,764
250 4,191,766
4,191,767
251 4,191,768
263 4,191,769
266 4,191,770
267 4,191,771
273 R 4,191,772
282 4,191,773
300 4,191,774
304 4,191,775
308 4,191,776
316 4,191,777
317 4,191,778
319 4,191,779
324 4,191,780

CLASS 425

7 4,191,516
286 4,191,517
326.1 4,191,518
332 4,191,519
387.1 4,191,520
432 4,191,521
552 4,191,522
589 4,191,523

CLASS 426

2 4,191,781
38 4,191,782
335 4,191,783
475 4,191,784
536 4,191,785
593 4,191,786
615 4,191,787

CLASS 427

74 4,191,794
82 4,191,788
97 4,191,789
164 4,191,790
224 4,191,791
260 4,191,792
276 4,191,793
351 4,191,795
408 4,191,796

CLASS 428

50 4,191,797
95 4,191,798
96 4,191,799
251 4,191,800
375 4,191,802
407 4,191,803
409 4,191,804
467 4,191,801
539 4,191,805

CLASS 429

56 4,191,806
176 4,191,807

CLASS 430

31 4,191,566
64 4,191,567
66 4,191,568
166 4,191,573
260 4,191,572
302 4,191,570
305 4,191,569
335 4,191,571
387 4,191,574
418 4,191,575
512 V 4,191,576

CLASS 431

208 4,191,524

CLASS 432

21 4,191,525
58 4,191,526
72 4,191,527
98 4,191,529
107 4,191,530
239 4,191,531
248 4,191,528

CLASS 433

102 4,190,958

CLASS 435

24 4,191,808
4,191,809
177 4,191,810
188 4,191,613

CLASS 521

27 4,191,811
28 4,191,812
31 4,191,813
32 4,191,814
51 4,191,815

CLASS 525

102 4,191,713
4,191,714

CLASS 526

124 4,191,816

CLASS 528

38 4,191,817
44 4,191,818
315 4,191,819
405 4,191,820
501 4,191,821

CLASS 542

416 4,191,822
426 4,191,823
429 4,191,824
430 4,191,825

CLASS 544

337 4,191,826

CLASS 546

116 4,191,827
185 4,191,828
222 4,191,829
274 4,191,830
278 4,191,831

CLASS 548

207 4,191,689
305 4,191,834
306 4,191,832
378 4,191,833

CLASS 560

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